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TONSILLITIS.

We now enter the air-passages; and the first disease of which I will speak is inflammation of the tonsils; called by Cullen *cynanche tonsillaris*, but frequently called by others *tonsillitis* (from "tonsillæ," *the tonsils*; and "itis," *inflammation*). The disease to which these names are given, is not an inflammation of the tonsils simply; for the surrounding parts are more or less affected. The velum pendulum palati and the uvula, as well as the tonsils,—one or both,—are red and swollen. The uvula is elongated, and its margins are translucent;—it becomes œdematous and swollen. If both tonsils be inflamed, on opening the patient's mouth you will see two large red balls, one on each side of the throat; which impede deglutition and speech. They may also be felt externally. When the tonsils are enlarged, people say "the almonds of the ears are down;" for the tonsils are called, in common language, "the almonds of the ears." Besides this swelling and redness, the secretion of the parts is altered; so that the mucus of the mouth is very tenacious,—slimy, as people say. There is frequently very great pain; for the inflammation affecting the tonsils is of a phlegmonous character; and the pain is sometimes very severe,—stabbing and shooting to the ear. Besides the shooting pain, there is necessarily great tenderness felt,—particularly on swallowing. Even the effort to swallow the saliva,—that is to say the mere effort of swallowing, without the presence of any firm substance to swallow,—gives pain; the motion of the part is productive of pain. You may see the disease sometimes on one side only, and sometimes only on the other; and it is said that the disease will shift from one tonsil to the other;—just as is sometimes seen in inflammation of the eye. When one eye gets better, the other will become inflamed; and a similar occurrence often takes place in the case of the tonsils; when one ceases to be inflamed, the other becomes so.

Sometimes, in addition to the inflammation producing redness, heat, swelling, and hardness, there is little ulceration;—there are specks of ulceration. Some persons, as soon as they have a sore throat, have specks of ulceration here and there, on the tonsils and uvula; with very little subjacent inflammation. Some persons have the mucous membrane inflamed alone. The inflammation is quite superficial;—without any inflammation of the subjacent cellular membrane, hardness, or enlargement. If the case be severe, there is a good deal of pyrexia. The pulse will become very quick in this disease, (as it sometimes will in acute rheumatism), without any danger whatever; and the tongue is frequently excessively foul;—I presume from the inflammation affecting it, as well as other parts. The foulness of the tongue is not at all in proportion to the danger of the disease; but I presume it arises, in a great measure, from the irritation being situated in that quarter of the body. The disease may terminate in resolution, as it is called; or it may terminate in suppuration. It is decidedly phlegmonous inflammation, so far as the

parts are concerned; and they very frequently suppurate; and when they do, the matter is found to be very offensive;—as offensive as if it were coming from a diseased bone.

The predisposing causes of the disease are, in the first place, a peculiar constitution, and disposition to it. There are some people who, in whatever way they may be exposed to the general causes of inflammation, continually get a sore throat. Whenever they are exposed to the vicissitudes of temperature, coldness, and moisture, they are sure to have inflammation of the throat; and this will run in families, so as to be constitutional. It certainly is predisposed to by mercury. When persons have been much under the influence of mercury, they are very liable (as I formerly mentioned, when speaking of inflammation in general) to take cold from the vicissitudes of temperature; and the throat is certainly particularly liable to inflammation from this cause. The youthful period of life appears more liable to tonsillitis than old age; for we see far more cases of inflammatory sore-throat in the young, than in the old. Perhaps, among the predisposing causes, I might mention the season of the year;—spring. Cases of this description certainly occur (from cold and wet) more frequently in the spring, than at any other period of the year. The *exciting* causes of the disease are, especially, cold and wet;—whether applied to the body at large, or to the feet only. Cold applied in any way, is sufficient to produce the disease.

With regard to the *treatment*, it is rarely necessary to take blood from the arm; but leeches around the throat, are particularly useful. I do not know that it is necessary to apply them internally to the fauces. I think that, applied *externally*, they answer every purpose they can; and that a free application of leeches, is far superior to blistering. As a general rule, in the treatment of inflammation, we must be upon our guard never to let blistering take the place of the removal of blood. If the inflammation be at all severe, you only harass a patient (in any disease whatever) by blistering, if there be a necessity to take away blood; and, in this disease, blistering is a very painful remedy. A blister produces great anguish, when applied to the throat; and does not, by any means, answer so good a purpose as leeches;—the frequent application of leeches externally, under the lower jaw, followed by poultices. The application of poultices not only tends to encourage the bleeding, but is a constant fomentation;—a mode of relaxing the parts, and causing perspiration there. If the patient be too weak for you to apply leeches, a blister then will be proper; or, if you have applied leeches as much as you think advisable, and still it is requisite to do more before the disease can be controlled, then blisters may be used with advantage. It must be remembered, however, that when a patient can bear leeches, you will find them the most useful.

I have found great benefit, in this disease, from a mode of treatment perfectly analogous to what is practised, with so much success, in some cases of inflammation of the surface of the body, and subjacent cellular membrane. You know that, in erysipelas phlegmon-

oides, or any kind of erysipelas where there is extreme tension and hardness of the surface, incisions do great good. They set the surface at liberty;—allow it to gape; so that the tension is removed, and great benefit always ensues. Now I have adopted similar treatment, frequently, in inflammation of the tonsils; and with very great effect. It is sometimes very difficult to know, in the case of the tonsils, whether matter is formed or not; and I dare say many practitioners (I am sure it has occurred to me) have plunged a lancet into the tonsils, in the expectation of finding matter, when there was none. They sometimes become so exceedingly large, that it warrants a person in trying whether there is any matter or not. Sometimes, when there is matter, instead of being softened, the parts are so tense that you will not find any fluctuation; and sometimes they are swollen so much, that you would fancy there was fluid when there is not. Thus mistakes are made on both sides. But whether matter comes or not, great relief is experienced by plunging a lancet into one or two places. The part is always very tense; if you put in a lancet it gapes; and when there is a little bleeding, the patient (in most cases) is better for it. I have seen it afford far more relief than leeches; and I know, therefore, that it is a very good practice to put a lancet in, for the purpose of making an incision in the tonsils. If there be any matter there, its escape is desirable; but even if there be none, you generally find very great benefit.

For the purpose of purging, there is nothing so good as a large dose of calomel; because it may be mixed with sugar, and put on the tongue; when it slips down easily. It is wrong to give acrid purgatives, such as salts, which stimulate the parts as they go down; and it is wrong to give any thing bulky. Castor oil easily slips down. Some persons recommend vomiting, in this disease; and it certainly causes a great discharge of mucus from the pharynx and larynx, and all the surrounding parts; and frequently does good; but, frequently, it is a severe remedy. I believe the free application of leeches externally, an incision or two in the tonsils, and a good dose of calomel, will, for the most part, cure the disease. Gargles are pleasant to the patient, on account of the tenacity of the mucus. A sour gargle is very grateful; and so, sometimes, is the inhalation of the steam of hot water. This relaxes the parts, and is found very agreeable; but I have often seen patients derive the greatest comfort from ices.

As to starving and low diet, you need not *inculcate* it; for the patient cannot swallow any thing. As soon as ever you are satisfied there is fluctuation,—as soon as you feel the parts soft, or if the part has been inflamed some days, and continues large, it is always right to make a puncture. If you do not choose to make a puncture to lessen the inflammation, still it is right to do it on the probability of there being matter; not only as soon as you feel fluctuation, but when several days have elapsed, and the part is swollen. It is wrong to delay this operation; for it is quite harmless, and productive only of momentary pain.

Although this is the form of the disease which we see every day, yet we occasionally find this affection occurring with debility. It is chiefly in old people that it occurs in this latter form; and chiefly in people who have had frequent sore-throats. When the throat has been sore very often, the inflammation is not of an active kind, but follows the course of gonorrhœa. When people have had the latter affection very often, the active symptoms are less severe; and so it is in the throat. When persons have had many attacks of tonsillitis, the inflammation is generally less active; the parts are not of so bright a red; they are of a more *dingy* red; there is less pain; and the swelling is greater in proportion to the other symptoms. In such a case as this,—with such debility of constitution, the shortest way is to give stimulating gargles;—for instance, the decoction of seneka, with Cayenne pepper and brandy in it. If the patient be weak, you must give good food; and sometimes allow a little wine. The case may be (like any other inflammation) *active*, and to be treated as first pointed out; or it may be *passive*, and require only local astringents and stimulants. But sometimes the whole constitution is weak; and you have to support the patient with good food, and perhaps even wine.

It is when this disease occurs with *ulceration*, that treatment of this kind is most frequently required. Sometimes, when the disease occurs with ulceration, there is a great tendency to mortification. This is a case that must be treated on the principles I before mentioned;—good food, more wine, and perhaps quinine. But good food and wine, are among the best things; and you must also employ stimulating applications, together with stimulating gargles. In this case, too, the chlorides of soda and lime answer very well;—that is, when the patient simply requires a stimulating gargle.

It is not, however, in every case of inflammation, that you are to presume there is ulceration; but (as I mentioned when speaking of ulceration of other parts of the body) where there is ulceration, you must adopt the antiphlogistic regimen. Many cases of ulcers of the leg have I seen yield to antiphlogistic treatment, after all other means have failed; and so it is in ulceration of other parts of the body. You see the parts red, and there are signs of strength; and the shortest way to cure the ulceration is to bleed locally and generally, and put the antiphlogistic plan in force. Ulceration occurring in the throat, however, is most frequently of an opposite character. This ulceration of the throat is most frequently seen in scarlet fever; where it is called "cynanche *maligna*;" but ulceration of the throat frequently occurs without scarlet fever at all. In these circumstances, it is frequently necessary to inject stimulating gargles, several times a-day. One of the best applications is the acetate of copper made into a gargle. There are many good ones; but this is one of the best.

Chronic ulceration of the tonsils is also very common. It is, you know, one of the common effects of syphilis.

ENLARGEMENT OF THE TONSILS.

But, besides this, the disease itself (to say nothing of inflammation in other parts) is sometimes chronic; and it is then attended with permanent *enlargement of the tonsils.* This is more frequently seen in children than others. The tonsils, after they have been inflamed, remain hard,—fall into a state of chronic inflammation, induration, and enlargement;—from lymph, I presume, having been effused into the cellular membrane. There is no difficulty, in cases of this description, in making a diagnosis. If you fail to make it externally, you have only to make the patient open his mouth, and you see the disease. The best treatment is the moderate exhibition of calomel, so as slightly to affect the mouth; the use of iodine, internally or externally; and of hydriodate of potassa. Iodine, in both forms, has great power in dissolving and dissipating induration and enlargement. There can be no impropriety in combining both plans. If there be much tenderness, leeches are very proper.

Occasionally this enlargement is not the result of *active* inflammation, but takes place *slowly*; and friction with iodine, or hydriodate of potassa, or both, is a very good thing. Sometimes you will see cases, in which it is judged right to have recourse to surgery;—to extirpate the tonsils, or tie a ligature; but the greater number of cases do not require this, provided you treat them early and perseveringly by mercury, or iodine and hydriodate of potassa, both internally and externally.

FŒTID BREATH.

Speaking of diseases of the tonsils, I may mention that persons are sometimes consulted, on account of the patient having a fœtid breath; called, in vulgar language, *a smoky chimney.* It must be very annoying if people are married, or in the way of being married; and I have no doubt that it has frequently prevented that interesting ceremony from taking place.

Fœtid breath may arise from many causes. It may be accidental, from a person eating something nasty; which enters into the blood, and is poured forth from the vessels of the bronchia, till the blood gets rid of it all. If a person eat onions, it is not while they are in the *stomach* that the breath is fœtid; but when the odorous principle of the onions gets into the blood, it is poured forth from the bronchial membrane. The bronchial membrane is found, by physiological experiment, to be one of the great outlets by which the body gets rid of improper things taken into the blood; or, at least, of things foreign to the blood. Carious teeth, or a diseased bone, is likewise a cause of fœtid breath; but one very common cause is a depraved secretion of the tonsils. If you look into the mouths of these patients, you will frequently see the tonsils enlarged,—one or both; or, at any rate, you see them containing a cheesy matter. If this be pressed out with the handle of a spoon, the person's breath (for the time) is so much the less offensive. I should imagine

that stimulating the follicles to a greater secretion, would favour the escape of this stuff; and not allow it to accumulate there, and form these nauseous concretions; but the individual's breath itself may be offensive, independently of this stuff.

PUSTULES OF THE MOUTH.

You will repeatedly have children brought to you by their mothers, with pustules on the tongue, and lips, and inside the cheeks. I do not know that the disease has any specific name; but the tongue, the sides of the cheeks, and the lips, are elevated in consequence of the pustules; and the tongue is frequently much swollen, and just the colour that it is, when persons are much under the influence of mercury. From the swelling of the tongue, the quantity of mucus secreted, the saliva running out of the mouth, and the fœtid state of the breath, you would imagine, at first sight, that the child had taken mercury; but if you give calomel as a purgative in such a state, it does not increase the mischief, but answers well as a purgative. It is one of the best to give children.

I have found great benefit, in these cases, from the use of washes containing some astringent; but the best mode of giving it to the child, is to put a grain or two of sulphate of zinc (for example) into an ounce of syrup. The child has no objection to it; and it exercises a beneficial influence. The disease sometimes occurs to many children in one family; but whether it is contagious I do not know. The disease is described as common ulcers in the mouths of children; and they may last some time without any danger; but purgatives and local astringents are very useful. Whenever you have to apply an astringent to the mouth of a child, it is best to give it in syrup, instead of water.

APHTHÆ.

There is a disease that frequently affects the mouth, and neighbouring parts; and usually in the period of infancy. It is called the *thrush*; or, in medical language, *aphthæ* (from απτω, *to set on fire*). It is always mentioned under diseases of the skin; but as it occurs in the mouth and throat, it is perhaps hardly right to call it a cutaneous disease;—it is a disease of the mucous membrane. It consists in the formation of vesicles within the mouth and lips, and all the way along the cheeks, the tongue, and the velum pendulum palati; and even on the mucous membrane of the hard palate, the tonsils, and pharynx. On opening the mouth, you see an appearance just as if the patient had been taking milk, curds and whey, or some chalk mixture;—all the vesicles are exceedingly white. This is produced by innumerable elevations of the cuticle, by a fluid, and a large number of minute vesicles. There is sometimes a good deal of inflammation with it; and sometimes you will see scarcely any thing more than this white appearance, as if the parts were filled with curd.

This disease certainly is most common in infants; but you will

frequently see it in adults, at the end of chronic diseases;—at the end of phthisis, for instance. It is very common then for persons to complain much of the throat;—to complain of a difficulty of swallowing; and even when persons die of diseases of the abdomen, of various sorts, it is very usual indeed to see aphthæ before death. It will occur in old people, from very trifling causes. It is supposed to be a fatal disease, when it occurs in old people; or in those in whom a chronic disease has existed for a long time; but it is not an invariable rule. I recollect an old lady of ninety. She was so old, that nobody thought of saying how old she was. She had been ninety so long, that nobody continued to add the odd years;—just as is the case with *horses*. Indeed she was the wonder of the village. At that advanced age she suffered an attack of bronchitis, and got well; and afterwards attained the age of one hundred;—how much more I cannot tell; but I know she lived ten years after the attack, notwithstanding it was united with aphthæ; and therefore aphthæ is not a fatal sign in old people. You see the disease every day, however, in persons who are dying of chronic diseases. I believe old women say, that you must have the thrush *first* or *last*;—that if you do not have it when you are *young*, you must have it when you are *old*. I only mention this to shew how common the disease is.

When the disease occurs in infants, it may be so slight as to require scarcely any treatment; but if it do, you find it useful to employ the warm bath, and attend to the bowels. There is frequently irritation of the mucous membrane lower down in the alimentary canal;—frequently sickness, and frequently diarrhœa; and therefore you sometimes find it useful, besides the warm bath, to have recourse to purgatives; and besides that, it is sometimes necessary to employ Hydrargyrum cum Cretâ, and opium. There is often tenderness on pressure; and then it is necessary to apply poultices over the abdomen, as a constant warm bath; and to apply a leech or two; but often a mustard-poultice answers best. A small portion of ipecacuanha, or camphor, is often serviceable; but nothing is better than a mild astringent in syrup;—such as I have mentioned already, (made with a minute quantity of sulphate of zinc). Many people employ borax and honey; and old women tie a rag to a stick, and mop out the child's mouth; and thus make things worse. They had better use a camel's-hair pencil; or leave the disease to pursue its course. I have no doubt that the chlorides are useful; but of course, in the case of children, they must be given very much diluted. In adults I do not know any means so useful as the chlorides. They will frequently change the appearance of the mouth almost immediately; but they require to be well diluted. The common solution must be diluted with six or eight times its weight of water. When the intestines have been in a state of irritation only, a few specks will appear at the rectum; and then old women consider that the disease has had a long journey, and has shewn itself at the other end. If, however, you look into the intestines, you find no inflammation, only specks; and it is only towards the anus, that

these specks appear. Nevertheless, the irritation which produced the vesicles, certainly does frequently extend all through the alimentary canal.

EAR ACHE.

Before I quit these parts, as we are so near the ear, (which communicates with them by the eustachian tube), I must direct your attention to what is commonly called the *ear-ache*. It is not, in general, an important disease; but sometimes it is of very great importance. You will recollect I mentioned, when speaking of inflammation of the brain, that the latter will spread from the ears and eyes. I have seen several cases of phrenitis, which have spread from the ear. Common ear-ache is not a thing so free from danger as tooth-ache. We see ear-ache every day; and think nothing of it when persons complain; but, in any case, it may be dangerous.

Ear-ache always arises from more or less inflammation in the meatus auditorius; and ought always to be attended to. Leeches should be applied externally, and blisters; and, in some cases, the patient should be bled in the arm. After it has lasted a long time, the bones frequently become carious; and when the bones are carious within, inflammation of the dura mater lying upon the petral portion of the temporal bone, is likely to come on; and then it is all over. After death, you will find matter formed within the ear itself; but you also find it formed upon the bone under the dura mater; and, perhaps *above* the dura mater,—in the arachnoid, and various other parts. Perhaps you find it on the pia mater, and other parts of the head. Encephaloid disease, and other affections, take place; the patient becomes delirious, and is soon gone. Therefore, when you see intense ear-ache, and the patient complains of pain in some other part besides the ear, and you observe a wandering of the eyes, it is well to tell the friends that he is in the greatest danger.

Of course such a case (like other cases of phrenitis) ought to be treated actively; but I believe, in almost every case, you will find all treatment unavailing. There is a local cause (that is to say, disease of the ear) keeping up inflammation of the part; and therefore you cannot expect to be successful.*

PHARYNGITIS.

There is also inflammation of another part of the throat, very far back, spoken of by Cullen; and I therefore legitimately touch upon it; namely, *pharyngitis*,—inflammation of the pharynx (from φερω, *to conduct*); or, as it is called by Cullen, "cynanche *pharyngea*."

Pharyngitis usually takes place from the mere spread of inflammation from the tonsils. When the tonsils are inflamed, it is very common for the inflammation to go farther back. Inflammation knows nothing of our artificial division of organs, and division of

* For the best account of Diseases of the Ear, the reader is referred to Kramer's Treatise; which has recently been translated by a young physician of great promise,—Dr. J. R. Bennett.

diseases; but away it goes along the mucous membrane; and the pharynx is continually becoming inflamed. Now and then, however, we have it in an *idiopathic* form; that is to say, it occurs as a distinct, separate disease;—not coming on with any other disease. I have myself seen one or two instances of it. When this inflammation exists, there is redness at the back of the throat. On looking into the mouth, you see the posterior part exceedingly red. Deglutition is very much impeded; but respiration is not at all difficult. At any rate, if there be any difficulty of respiration, it is slight. The voice is not affected, any more than respiration. It is the gullet that is affected; and therefore persons can speak and respire very well.

With regard to *treatment*, it is the same as that for inflammation of the tonsils; and therefore I shall not dwell upon it.

STRICTURE OF THE ŒSOPHAGUS.

We are frequently consulted upon a disease rather lower down than the pharynx. I refer to stricture in the œsophagus, producing obstruction.

In this disease there is, as in inflammation, a difficulty of deglutition; but then there is no sensation of heat in the part,—no soreness; and, for the most part, no pain. The difficulty of deglutition is chronic; and, for the most part, has come on very slowly. It is easily ascertained by the application of a bougie or probang; and this, I may say, is the only remedy; for medicine can do no good in stricture of the œsophagus. When patients come to you with a difficulty of swallowing, if you ascertain it is not in the throat, but a little lower down, and you find the stricture has come on slowly, it is right to pass an instrument down a certain distance. This being the case, you employ surgery, and surgery only.

But you will sometimes see this disease in a different form; and it is then entirely of a *spasmodic* nature. Frequently, when persons have not a *permanent* stricture of the œsophagus, they have occasionally a *spasmodic* stricture in the part;—just as they have in the urethra; so that it will be ten times worse at *one* time, than it is at *another*. This occurs more frequently in women than in other persons; and frequently it is connected with hysterical symptoms.

The best mode of treating it is, to use the shower-bath; to purge the patient well; and to use oil of turpentine, and other remedies of that kind. I have read of cases where it appeared to give way to mercury; but I have not seen them myself. It has always appeared to me, that they would do better with the common remedies of hysteria; by purging, on the one hand; and by lessening the irritability of the body at large, (by means of the shower-bath, the administration of iron, and putting the health generally into good order), on the other. But you must carefully remember, that the œsophagus is very liable to spasmodic stricture, without any danger at all.

LARYNGITIS.

I shall now proceed to consider inflammation of the commencement of the air-passages, properly so called;—inflammation of the larynx,—*laryngitis*. This disease is not mentioned by Cullen. He speaks of "cynanche *trachealis*;"—he speaks of the wind-pipe, and of croup; but not of this particular inflammation situated in the larynx. Indeed, so little was it formerly attended to, that when two or three physicians died of it, some years ago, it was considered almost a new disease; but on looking into old writers, you will find it well described. As you may suppose, inflammation of the larynx must have existed from the time that people had a larynx; and therefore this disease must have been known before.

In this affection, there is hoarseness or whispering; and, indeed, almost suppression of the voice. The breathing also is hoarse, loud, and rough. The inspirations which are taken are long. There is great dyspnœa; and, besides the constant dyspnœa, there are paroxysms of much greater dyspnœa, in which every muscle of the body comes into play; the eyes start; and the person looks as if he were being hung. These are spasmodic fits of difficulty of breathing; supervening, from time to time, on constant dyspnœa. Such is the state of the parts, that there is also frequent orthopnœa (from ορθος, *erect*; and πνοη, *breathing*);—that is to say, the person cannot breathe unless he be erect. From the great difficulty of breathing, the face is pale and ghastly; the lips are pale and livid;—not of a *purple* colour and livid; but *pale* and livid; and perhaps the face and throat are swollen. There is pain felt in the throat, exactly in the situation of the larynx; and if you press the larynx, you are sure to find it tender;—if you press the sides together, or press down upon it, you find it tender. Sometimes, but not always, there is redness and swelling of the face.

Sometimes there is swelling and redness of the fauces, of the velum pendulum palati, and uvula; and, indeed, of the tongue. Occasionally, cynanche tonsillaris co-exists with laryngitis. Indeed, it *frequently* does so;—the inflammation commencing in the tonsils, and spreading into the larynx. The epiglottis is very often swollen. The epiglottis is a part of the larynx; so much a part that, in many anatomical books, it is enumerated with the cartilages of the larynx. Sometimes there is cough, but not always; and with the cough there is hoarseness; so that you will have the *voice* hoarse, the *breathing* hoarse, and the *cough* hoarse. Sometimes, too, there is difficulty in swallowing. In the function of deglutition, the larynx (you know) is raised and brought forward; and if a part of the larynx so much pressed upon be inflamed, of course there is a difficulty of deglutition;—*dysphagia*, as it is called (from δυς, *difficult*; and φαγω, *to eat*). There is also expectoration of viscid mucus. This you would suppose; for the inflammation being seated in a mucous membrane, will, of course, affect the secretion of that membrane. The tongue, likewise, is very foul; from the inflammation taking place in its neighbourhood.

These are the *local* signs; and they are those of inflammation;—redness, swelling, heat, and pain.

From the disturbed function, there are also *general* symptoms. There are thirst, heat, extreme restlessness, and great anxiety. The difficulty of breathing must occasion great restlessness, and extreme anxiety. The pulse is rapid; and there is at last a clammy sweat. The pupils, too, at last become dilated; and the patient keeps his mouth constantly open. The difficulty of breathing occasions, I presume, such an accumulation of blood in the head, that more or less compression exists; and the pupils consequently become dilated; and the patient, from the want of breath, opens his mouth, gasps, and makes an effort to take in all that he can.

This disease, when acute, lasts only about three or four days. Of course, I do not include the previous days, on which there may be cynanche tonsillaris; but from the time the larynx becomes actively inflamed, the duration is not, in general, more than three or four days. Death sometimes occurs very suddenly. A violent spasm takes place; and the patient is destroyed presently.

This is a disease which occurs almost always in adults. In children we have *croup*,—inflammation of the *wind-pipe*; but when inflammation of this violent kind attacks adults, it affects the tube higher up;—it affects the *larynx*; and it has, therefore, been called "the croup of *adults*." After death, we find the mucous membrane of the glottis, and of the posterior part of the epiglottis especially,—perhaps the mucous membrane of the whole of the larynx,—red, swollen, and œdematous;—swollen not merely as mucous membranes are when inflamed, but from effusion into the subjacent cellular membrane. The rima glottidis is found to be nearly closed; and this would appear to be the great source of dyspnœa;—the œdematous state of the parts, which produces nearly a closure of the rima glottidis.

Sometimes the disease proceeds so far as to cause an effusion of fibrin; so that notwithstanding the disease is an affection of the *mucous* membrane, fibrin is poured forth, just as we see in a *serous* membrane; and sometimes we find a quantity of pus;—or, at least, of puriform fluid. Occasionally the tonsils are not merely red, as I stated, but even ulcerated; and occasionally the pharynx and the trachea below, and even the bronchia, are also inflamed. You are therefore not to expect one uniform appearance in the disease. You will find the essence of it, in all cases, to be a violent inflammation of the larynx; and, in general, an œdematous state of the rima glottidis and the parts around; but frequently you will find inflammation higher up, about the tonsils and the velum pendulum palati;—perhaps, also, inflammation of the pharynx. With respect to the quality of the fluids, they will vary from thick mucus to puriform fluid, and even up to fibrin; but that which you particularly notice, is an œdematous state.

Now all these appearances are nothing more than you would expect before-hand. The œdematous state, which perhaps is fatal, is nothing more than what occurs when the cellular membrane is

inflamed in any other part of the body. When inflammation is situated near cellular membrane, it secretes abundantly. In violent inflammation of the skin, the cellular membrane secretes to a great extent; so that you have more or less œdema; and the same thing occurs here; but from the circumstance of the parts being air-passages, and the inflammation being in the narrowest part of the passage, it is often dangerous. The same occurrence, situated a little higher in the pharynx, produces only a trifling inconvenience.

The disease begins from a catarrh. The person has a common cold; and the latter generally arises from cold and wet. The application of cold alone will produce the disease; but it usually results from an union of the two, applied either to the throat or to the feet. A few days after exposure, the patient has great hoarseness; and then pain in the larynx comes on. Sometimes it does not arise from a common cold; but, as I have mentioned already, a pretty brisk inflammation of the tonsils takes place, and it spreads from them. Occasionally, too, it takes place suddenly; but I have seen it in the middle of a chronic disease. There is no part of the body which can be inflamed *chronically*, that may not become the seat of *acute* inflammation; and therefore this occurrence may take place in the throat. When there is a syphilitic sore-throat, or a chronic affection of any kind, patients may suddenly experience great difficulty of breathing, and be in the greatest danger from active acute laryngitis.

This is a disease in which, if in any, it is necessary to be most active in treatment. No trifling practice is admissible here. You cannot trust to nature; nor can you trust to *medical* measures alone;—for it is necessary (in cases which last any time, and which become very severe) to use the combined force of medicine and surgery. The first thing to be done is, undoubtedly, to bleed freely in the arm;—to make the patient faint, if you can; and then to cover the throat with leeches. I am taking it for granted that the patient is able to bear it. The disease may attack a person with syphilitic sore-throat; and he may be worn out with mercury and disease, so that you may not be able to bleed in the arm; but still, in most cases, I am satisfied it would be best to set the patient upright, and take as much blood as he can spare;—be it three, or four, or twenty, or thirty ounces; and to produce fainting, if possible. There can be no rule for the quantity; but it may be necessary to take thirty or forty ounces, and to apply from six to thirty leeches; according to the age and strength of the patient. After the leeches, a poultice for some time may be a good application; and then, after all, a blister, if you please; but not earlier.

In this disease mercury is recommended, even by those who do not ascribe any active power to mercury in general. It is of the highest importance to get the mouth tender as early as possible; and therefore you must not wait a couple of days for salivation to take place. You will find, in the "Medico-Chirurgical Transactions," a solitary case of the disease recorded, where ten grains of mercury were given every two or three hours, till ptyalism was produced;

and as soon as the patient began to spit, the affection ceased. I have treated many cases of the disease in this manner; and with the greatest success. In treating a case of this kind, it will not do to give a few grains of calomel night and morning; for the patient is in constant jeopardy; and you are never sure of his life, from hour to hour. It would be a good practice to rub in mercury on the extremities. If you exhibit mercury by the mouth, it is necessary to give it in large and repeated doses. I will not say any thing about the dose; because if you know that the patient is soon affected by mercury, a small quantity will do. I only state that it is necessary to get the mouth sore, in one way or other, as soon as you can.

If the patient be in great danger,—if his attacks of difficulty of breathing come on frequently, it will not be right even to wait for ptyalism; but it will be requisite to make an opening into the throat, so as to enable the patient to live till the mercury produces its effects. Bronchotomy is absolutely necessary, in many cases of this disease. By opening the air-passages below the part inflamed, instantaneous relief is afforded; and the patient will live so much the longer. This cannot have the effect of curing the disease, but it has the effect of enabling the patient to live longer;—to live, therefore, till you adopt other means to cure him. I have had (to speak as a pathologist) some very *beautiful* cases of this description; where the combined force of the two great divisions of the profession, has most decidedly saved the patient's life; but where neither would have done alone. A mere opening of the larynx will not cure the inflammation, and the patient may die before the mercury can have any effect; and, therefore, it is necessary to watch the patient constantly; and if the symptoms decidedly grow worse, the operation ought to be performed without delay. It is an operation which is by no means dangerous; it is one which, if properly performed, can do no harm. The dyspnœa arises, as I have said, from an œdematous state of the rima glottidis; and if you enable the patient to breathe notwithstanding that, as the inflammation subsides the œdema goes down. The paroxysms of difficulty of breathing, clearly arise from spasm; and if an opening be made below, so that the patient can breathe through it, the disease may occasion as much spasm above as it chooses; but your patient is safe.

You are aware that the least pressure in these parts, will occasion spasmodic difficulty of breathing. In the "Medico-Chirurgical Transactions," you will see a case described by Mr. Lawrence, of a person who had attacks of dyspnœa, which arose from the mere pressure of an aneurism of the arteria innominata. The aneurism slightly pressed on the trachea;—the pressure was as slight as it could be, to be pressure at all. The direct diminution of the trachea by the tumor, was found to be very inconsiderable; but it was sufficient to produce irritation, and to cause violent attacks of spasmodic dyspnœa.

But the inflammation itself,—to say nothing of this œdema and tension of the parts,—the inflammation of the membrane itself, will

throw the parts around into violent spasm;—just as you see the inflammation of the urethra and bladder. When inflammation exists about the larynx, the person is continually seized with a violent difficulty of breathing, without any pressure, but merely by the irritation; and many persons, without any inflammation about these parts deserving the name of laryngitis, will die in a moment. I have seen several cases of persons, who have been seized with a sudden difficulty of breathing, when they were supposed to have only a common sore-throat; some of whom have died in the course of three or four hours, and some in a minute. When inflammation exists in the fauces, and extends to the glottis, without descending to the larynx and producing laryngitis, the person may be seized with spasmodic difficulty of breathing, and die instantly. I saw a young man, about three years ago, who had been frightened in consequence of his mistress pulling him out of bed, where he was with a girl, one night. This made him nervous, and therefore liable to spasmodic diseases. He merely caught a common sore-throat, for which six leeches were applied; and while the ward was full of medical men, a violent spasm seized his throat, and he died instantly. Every thing was done for him that could be done; but he was quite dead. I have seen several patients with more decided inflammation than this, (but still not with inflammation deserving the name of laryngitis), who have died in a moment. When, therefore, there is laryngitis, you may well suppose how dangerous the case is; and how necessary it is to be active in the highest degree. Whenever a patient becomes very hoarse, and you hear his voice hissing (sibilous) through the larynx, and find the tube is tender on pressure, alarm should instantly be taken, and the disease treated actively;—although the patient may make no particular complaint himself; and although, on looking into the throat, you cannot discover any thing particular.

Morgagni and others have described this disease;—proving that it is nothing new to medical men; but from their being no "outward and visible sign," in some cases, it was called "angina *occulta*;" to distinguish it from common sore-throat, which they called "angina *manifesta*."

A much more common disease than this, however, is *chronic* laryngitis; an affection of which you will see many cases. This species of the disease is attended with a very hoarse cough, and likewise with a hoarseness of the voice; and sometimes the person, both when coughing and talking, appears almost to crow;—makes a sort of crowing sound. The alterations in the voice are very great. There is hoarseness, roughness, squeaking, and crowing; and sometimes it is nearly suppressed. The cough, too, varies in the same way. Sometimes it is very hoarse; and sometimes very shrill. The respiration in chronic laryngitis, is occasionally hissing; but not necessarily so. It is observed in *most* cases; but by no means in *all*. There is a copious discharge of mucus, and sometimes of pus. There is in all these cases, I believe,—at least I have always observed it,—pain on pressure. If the lungs be sound, you must

learn that chiefly by means of auscultation ;—by listening, and finding the sounds of the chest healthy ;—finding that there is no pectoriloquy. However, it is sometimes difficult, when the voice is nearly suppressed, to make up one's mind on the subject. Some say they can tell it as well when the voice is suppressed, as when it is not; but I confess I have not attained that perfection.

This disease may occasion great emaciation ; and from that circumstance, as well as on account of the discharge of mucus of a puriform character, patients may easily be supposed to be in a state of pulmonary consumption ; and it is a fact, that the disease does sometimes co-exist with phthisis pulmonalis. After death from this disease, we find the common results of chronic inflammation. The mucous membrane is frequently thickened,—frequently indurated, —frequently granulated ;—exceedingly rough, and containing numerous little cavities, if I may so call them. Frequently it is ulcerated. The same appearances very often extend along the trachea.

In the treatment of this *chronic* form of the disease, we are by no means so successful as in that of the *acute*. In fact, the treatment, for the most part, is very unsatisfactory. The best method you can adopt, is the repeated application of leeches, and subsequently of blisters. The internal exhibition of mercury, too, is of the greatest use. If the disease be a *scrofulous* inflammation, however, of course mercury will do no good, but rather make things worse. It is best, in almost all cases, to give it a fair trial ;—taking care not to hurt the constitution ; but to make the mouth moderately sore, and to keep it so ;—to treat it as a mere chronic inflammation. It will very frequently subside ; but far *more* frequently, I believe, the treatment is very unsatisfactory.

On account of the sufferings of the patient, and the harassing cough, it is often necessary to give narcotics, to procure sleep. Conium answers exceedingly well. Some have found relief from the inhalation of the fumes of tar; and others from the inhalation of chlorine ;—either by diffusing it through the apartment of the patient, or making him breathe through water in which a quantity of chlorine exists. But it is very necessary, in all these cases, not to push the matter to irritation. Tar-fumes, chlorine, and many of these things, will produce very great irritation, even in a small quantity; and therefore it is right always to begin by impregnating the water, or the apartment, very *moderately*; and if it produce no irritation, then you may go on to a great extent.

Some have recommended, as internal medicines, copaiba and cubebs ; because they have done good in irritation of another mucous membrane. I have not been satisfied with these medicines ; but as they are recommended, I mention them. Some have recommended the application of lunar caustic. A solution of nitrate of silver is made, into which a sponge is dipped, and pressed down to the rima glottidis, so as to produce a new action there, and lessen the morbid sensibility; with the hope that the same good change which is observed at the spot at which the nitrate of silver is applied, may

spread downwards. I have known this remedy employed; and, as you would imagine, fruitlessly; but if the disease were situated merely at the rima glottidis, good would be done by it. I have no experience of it myself; but I have seen cases, in which I understood it had been employed without any harm.

APHONIA.

It is right you should be aware that the voice is sometimes lost, or reduced to a mere whisper, without any inflammation,—without any œdema,—without any obstruction, as it would appear, of the parts. This affection, which is called *aphonia* (from *a privative*, and *φωνη, voice*), occurs chiefly in females; and is altogether what we call a "nervous" complaint. It occurs sometimes in boys as well as in girls; but it is chiefly an affection of women. I think it is easily made out. There is no tenderness of the larynx on pressure; there are other nervous symptoms in the body; and the person is weak and nervous altogether. Frequently there is no tenderness on pressure, and frequently no cough; or if there be cough, there is nothing else;—no pain with it;—no expectoration; and the disease frequently comes on suddenly, and goes off in the same manner. It has frequently come on in the course of a few minutes;—at any rate, in a day. It ceases, perhaps, as suddenly; and then comes on again.

This (as I before observed) is altogether a *nervous* affection of the part. There is no danger whatever; but sometimes a person loses his voice for many months; and I have heard of cases where they have lost it for years; and, from a sudden circumstance, without any apparent reason, the voice will return. I do not know any mode of treatment better than the shower-bath; and attention to the improvement of the general health, in every way you can.

CROUP.

Acute inflammation of a very violent description, when it attacks the larger portion of the air-tubes, is situated, for the most part, lower down in children than when it occurs in adults. That intense, violent, adhesive inflammation,—inflammation, at least, causing a portion of fibrin to be thrown out,—which attacks adults, usually affects the larynx; so that *laryngitis* is the disease of adults; and the disease of children, corresponding with this, is *croup*;—"cynanche *trachealis*," or more properly *tracheitis*. The latter term is the most simple; and every body knows what is meant by it. The disease has been called *angina trachealis*; because there is a quantity of lymph formed. In this country it is called *croup*; in the east, I understand, it is called *roop*; and perhaps it is so in other places.

This disease is marked by a rough, clanging, ringing cough;—a cough which gives you the idea of sound conveyed through a small brass pipe. Besides this cough, if the disease be severe, there is hissing (sibilous) respiration; but it is chiefly in the inspiration that it is heard. It is harsh, rough, shrill, or hissing;—there being various modifications. The voice, too, is either harsh, crowing, or nearly

suppressed. There is a difficulty of breathing; and this is felt particularly during inspiration. These are the most common symptoms. There is no difficulty in swallowing; no pain in the throat, except at the lowest part; no pain in the larynx (where there is always pain or tenderness in laryngitis); but in croup, at the lowest part of the throat, where the trachea exists, there is frequently pain on pressure. The expectoration is mucous; sometimes mixed with fibrin and shreds of lymph.

As this is a violent disease, there is violent pyrexia. During the first stage the face is flushed, the pulse is rapid, and there is great anxiety of countenance. Sometimes the peculiar clanging cough is heard for some days, before the child is ill enough to shew its complaint; so that many mothers have been surprised, on being told by a medical attendant, (who has accidentally been in the house, and heard this peculiar cough), that the child was in danger. The disease may last from twenty-four hours, to three or four days, or even *several* days; and the child may either die completely exhausted, or be suddenly cut off in a moment, by spasm. Just as *death* sometimes occurs suddenly, so does *amendment*. Generally, patients recover by *degrees*; but sometimes they recover very *rapidly*, —almost *suddenly*. When recovery is exceedingly slow, shreds of fibrin are perhaps spit up for several weeks.

On examination after death, we find, of course, redness of the trachea; and such is the intensity of the inflammation, that lymph lies upon the red membrane, sometimes forming a complete tube, and even extending into the bronchia. Besides this tube of lymph, which is so continually seen, we frequently observe a quantity of puriform, and even bloody fluid in the air tubes. There is a secretion not merely of fibrin, but likewise of puriform fluid;—exactly as occurs in a serous membrane. When you open an inflamed serous membrane, you always see lymph lying upon the affected part; but, besides that, you always see more or less turbid serum even so thick and yellow as to approach to pus; and sometimes there is pus. So in a mucous membrane, when it is inflamed very intensely, besides fibrin you see a quantity of thin fluid inclining more or less to pus; till at last you see actual pus. You also see a bloody fluid.

This disease occurs chiefly in children, between weaning and puberty. It is occasionally seen in infants at the breast; but more frequently not till they are weaned; and professor Home, of Edinburgh, says that the sooner children are weaned, the sooner they are liable to it. They have more experience at Leith than we have here; and observations, therefore, are more easily made than here. It chiefly affects those of a full habit of body.

The cause is undoubtedly, in almost every instance, cold and wet. It occurs, therefore, more frequently in winter and spring, than at other times; and if it occur in summer, it is generally when a damp evening has succeeded to a hot day. It is seen most frequently in a situation near the water side;—in fact, in all damp situations. It is more frequent, too, in northern than in southern

latitudes. It is sometimes epidemic;—that is to say, a great number of children, in particular seasons, are affected with it. You know that an endeavour has been made to pervert the word "*epidemic*" from its common original meaning;—"that which attacks people at large." In that sense you have a peculiar signification; so as to distinguish between *epidemic* and *contagious* diseases. But *contagious* diseases may be *epidemic*;—not from this cause or that; but merely because they extend temporarily over a whole district at once. But although this disease is frequently epidemic, I cannot believe that it is ever contagious;—at least, I have never been able to satisfy myself that such was the case. It certainly does often affect more than one in a family at once; but this may only arise from all the children in the family being exposed to the cause at the same time; and from another circumstance,—that there is a constant tendency to it; and therefore children in the same family, may be supposed liable to the same disease. Now and then, a peculiarly striking circumstance takes place; and we are inclined to believe that the disease must be contagious; but I think mistakes are frequently made in the case of croup. I will not say that it is *never* contagious, because I have not seen every circumstance that other people have; but, from what I have seen and read, I cannot persuade myself that it is contagious. It is a fact, that many children have it in the same neighbourhood; but then they have been visited with the same vicissitudes of atmosphere; and the occurrence may thus be explained. And when it occurs in the same family, this fact might explain it;—together with the additional circumstance, that all constitutions are predisposed to the same disease. I know, too, that several children in a family will have it, but at different times; and some of the children in a family will be sure to have it; and therefore I presume there is a constitutional tendency to it;—just the same as in inflammation of other parts. Professor Dupuy says, that it once occurred in dogs at Alfort; and that the same appearances were observed in them, as in human beings.

The treatment of this disease must be energetic and decided;—just as I stated was requisite in laryngitis. It would be right to bleed from the arm, or jugular vein, perhaps; and to apply a number of leeches over the throat. It is to be considered as an inflammatory disease, that must be treated briskly. I would make the same observation respecting leeches, that I have already done respecting other inflammatory diseases of the throat. I should prefer leeches to a blister, and general bleeding to local; but I should follow up general by local bleeding. After the leech bites had bled well, with the assistance of a poultice, I would repeat them, if necessary, and then apply a blister. There is extreme danger here; and therefore mercury should be given with the greatest freedom. Whatever disputes there are about mercury, you will find, that in acute hydrocephalus, in laryngitis, and tracheitis, mercury is of the highest importance. Children will bear a larger quantity of mercury, in proportion, than adults; and it would be right to give a child, every two or three hours, as much as it would bear without vomiting and

purging. This is a much better practice than the administration of emetics. Many cases will get well with emetics; but this will be successful in a larger number of instances. The warm bath is useful; but it is not of high importance; and, when the leeches have bled well, some have advised applying cold to the throat. I should think there can be no impropriety in it. Seeing the good effects of applying ice to the *heads* of children, there can be no impropriety in applying ice in a bladder to the *throat*; but I have no personal experience of it.

Some have recommended bronchotomy in this disease; but I believe it generally fails. Unfortunately there is frequently in this disease, besides laryngitis and tracheitis, inflammation lower down;—that is to say, the bronchial tubes, in their minute ramifications, are frequently affected at the same time; so that that portion of the disease will kill the patient, even although you subdue the inflammation of the trachea. Bronchotomy can only be a temporary measure. It may enable the patient to breathe well for the time; but of course it can have no effect upon the inflammation. If the disease were not so extensive, it might be beneficial, by giving you time to cure the affection; but, unfortunately, you frequently have inflammation of the trachea, larynx, and all the ramifications of the bronchia; so that it is hardly possible for the child to recover from such a mass of disease. However, bronchotomy has been tried in many cases, and failed; and I have myself employed it without success. You will find a number of cases mentioned, where it was of no use; though it appears occasionally to have been of service. You will find one instance (there may be more) recorded in the "Medico-Chirurgical Transactions," by Mr. Chevalier; who made an opening into the trachea; the consequence of which was the discharge of a quantity of viscid bloody fluid; and the patient speedily recovered. If, after the ordinary treatment of the disease,—free bleeding, mercury, blistering, the application of cold, and (if you choose) the administration of emetics,—if you cannot make the mouth more tender, or bleed any farther, and yet the child is dying,—it would be better, if the friends would allow it, to make an opening into the trachea; in order to give the patient a chance;—but, in a great number of cases, it is a very slender chance indeed. I would not do it till I had told the parents that the child would die *without* it, and would most likely die when it was *done*; for otherwise it would be said, that you had cut the child's throat, and killed it. It is a frightful thing to make an opening in the air-passages, unless you prepare the patients (or their friends) for it.

In America, they recommend a decoction of seneka in this disease. But this is a stimulating substance; and, if it does good, I cannot believe that it is the active inflammatory stage. When the inflammation is subsiding, and great secretion is going on, it may stimulate the parts and brace them up; but I have not been tempted to give the remedy in the active acute form of the disease.

This disease, however, occasionally takes place without any inflam-

mation; or, at least, any *important* inflammation. Children who have once had the croup, will frequently, on catching cold, have a crouping cough,—a little hoarseness; so as really to labour under the signs of croup; but you find, in such cases, that the pulse is not quickened, and that the child is not particularly ill. If a child have once had the croup, there is in general little fear from other attacks. If parts have been once inflamed, they soon fall into a state of inflammation again; but then it is not *active* inflammation; and sometimes the inflammation is scarcely perceptible;—the disease appearing to be merely spasmodic. I have known children have six or seven attacks of croup.

It is always safe, in these cases, to apply antiphlogistic treatment;—not vigorously, as in the first instance; but to put a number of leeches on the throat, and administer calomel once or twice a-day, and (if you choose) an emetic. These means generally dissipate the disease. I know that some patients neither require leeching nor purging; and you benefit them at once by an emetic. A slight inflammation has occurred; it has thrown the parts into a state of spasm; and an emetic will frequently cure it; but it is generally safer (unless you know that an emetic has cured the child before) to apply leeches to the throat, and give a dose or two of calomel. You are never sure that it is merely a spasm. You cannot tell that there is not some little inflammation; and you cannot tell that it is not increasing; and therefore it is the safest plan to begin with this treatment. If the child be not worse, but plays about, then the best thing is to give iron. Iron is a good thing to lessen morbid irritability in any part of the body. If there be inflammation it will do no good; but if there be mere morbid irritability, I know it is one of the best things. I shall have occasion to state that spasmodic cough, of a ringing character, yields most readily to iron. It is best not to begin with it; but to adopt antiphlogistic treatment for a day or two; and then you may give iron safely. You may give the carbonate in treacle; or the sulphate in sugar, or in tea. Children sometimes will not take it without these accompaniments.

ORGANIC AFFECTIONS OF THE LARYNX.

Besides simple inflammation of the larynx and trachea, these parts are subject to various organic diseases. The larynx is frequently in a state of ulceration; and not unfrequently there are excrescences upon it;—looking, to all appearance, like warts. They are the same as warts on the genitals. Sometimes scrofulous tubercles form there. Sometimes you have scrofulous abscesses formed in the cellular membrane; and sometimes you have cancer, and melanoid deposit.

As far as I know, in the greater number of cases, it is impossible during life to make a diagnosis between simple chronic inflammation of the larynx, and these organic changes. You find a person with tenderness of the larynx; you find him hoarse; you perhaps find his voice reduced to a whisper; you find him cough a great deal, and

the cough is ragged or shrill; you find him waste away, his pulse perhaps constantly quick; and you find tenderness;—shewing, altogether, that the larynx is diseased. But I confess, I am not able to distinguish between simple chronic inflammation of these parts, and ulceration, or the existence of excrescences, or the existence of various deposits. Others may be able to distinguish these cases; but I cannot.

In the commencement of such cases, I should recommend you to apply the remedies of chronic inflammation;—leeches over and over again; blisters afterwards, if you choose; a seton in the neighbourhood of the larynx; the exhibition of mercury; and narcotics to lessen the irritation. If these things do no good,—if you find the patient get worse, notwithstanding you are applying them vigorously; that the corporeal strength is decaying; and that the symptoms in the throat, so far from diminishing, are increasing,—then you may suspect there is organic disease; and you will generally be right. It is only in the latter stages of the disease, that any distinction can be made. When my remedies fail, I then begin to think there is organic disease.

Occasionally the larynx is ossified. Sometimes it becomes completely ossified; and deglutition is rendered very difficult. The larynx cannot move up and down; and the passage of the throat becomes so much diminished, that the patient can scarcely swallow; and, indeed, he dies of the disease.

ORGANIC AFFECTIONS OF THE TRACHEA.

The trachea, likewise, sometimes gradually becomes ossified; and all the various diseases that I mentioned under the head of organic affections (melanosis, scirrhus, cancer, and encephaloid disease) occur here. But more frequently we have thickening of the mucous membrane, induration, considerable excrescences, and scrofulous tumors; and then the common effects of inflammation;—ulceration; the formation of abscesses; and, finally, a carious state of the cartilages.

CATARRH.

The next disease to which I shall call your attention, is *catarrh*. This is a very slight inflammation of the larynx, trachea, bronchia, and the mucous membrane above these parts;—that portion called the *Schneiderian membrane* (from having been detected by Schneider); and the membrane of the frontal sinuses, and even the conjunctiva of the eyes. The inflammation, in this disease, is not by any means so intense, as that which occurs in laryngitis and tracheitis; for it is an instance of common inflammation of a mucous membrane. It is, in general, a very *slight* disease; but it extends through the whole tract, from the conjunctiva of the eyes;—running down the lachrymal canal; and not only affecting the membrane of the nostrils, but with them the frontal sinuses, the throat, the tongue, the larynx, the trachea, and bronchia. It is a very slight inflammation; but as it affects such an extent of surface, you will find dangerous symptoms more frequently than you are aware of. This, in medical language,

is called *catarrh* (from καταρρεω, *to flow down*); and, in common language, we call it "a cold."

There is a feeling, at the same time, of soreness throughout the body; and generally there is tenderness of the surface; which makes the person uneasy, if he press much upon any one part. There is stiffness, and an aching of the whole body; but it is chiefly felt in the back of the neck. There is likewise headache;—I presume, from the congestion in the frontal sinuses. Perhaps there may be more or less congestion within the head; but I should think that it arises chiefly from congestion of the frontal sinuses;—at least, that the former is inferior to the latter. There is likewise chilliness, and morbid heat. The patient is chilly, and creeps towards the fire; and yet if you touch him, he is hotter than he should be. If you make the observation yourself, you will find this to be the case; but there is great sensibility of the surface; so that the least breath of air blowing upon you, makes you cold. The mind also is affected. There is heaviness of the head;—sometimes amounting to stupor; so that people are quite stupid. From the state of the conjunctiva, there is freqnently stiffness and smarting of the eyes; and, from the irritation of the membrane within the nostrils, there is sneezing. There is, also, from the disturbance of the membrane, loss or impairment of smell, and apparently of taste. People tell you they can neither smell nor taste. I believe they can taste, although they cannot smell. Many things may be smelt as well as tasted; and these are tasted just as acutely as before. From the inflammation in the air-passages, the breath is hot; so that when you have a cold, if you expire the air from the lips, you find it hot; as though it came from a hot place. There is generally hoarseness, some cough, and a little soreness at the front of the chest. When the mucous membrane is inflamed, it is sore at the division of the trachea; and you find soreness in the situation of the larger branches of the bronchia.

All the parts that I have mentioned discharge more freely than in the healthy state. They are all covered with mucous membrane,—if the *conjunctiva* can be considered a mucous membrane; they are all in a state of slight inflammation; and therefore they are in a state of preternaturally increased discharge. The eyes "run" (called *lachrymation*); and there is a discharge from the nose (called in Latin *distillatio*; or, as we say, *catarrhus*). The discharge from the nose, is likewise called *coryza* (from καρα, *the head*; and ζεω, *to flow*).

At first, the secretion is limpid;—like drops of water from a rock. It is thin and transparent; but afterwards it grows more copious and thick. As the symptoms decline, the quantity of the secretion of course declines; and, as all the symptoms go away, there frequently arises a little inflammation about the mouth and nose, and an eruption; so that the common people make the observation, and say the cold is going, because there is a breaking out about the mouth. When the cold goes off, and the inflammation within ceases, it is

very common for slight inflammation of an herpetic character to take place about the mouth. During the existence of the disease, the tongue is white, the skin dry, and the urine red; and when all is declining, the urine has a lateritious sediment;—the common symptom of inflammation. There is also a loss of appetite. The stomach is much affected in this disease. People cannot eat; and sometimes there is also an affection of the mucous membrane down the œsophagus, and in the stomach. There is heat and pain there, and tenderness on pressure. The pulse during the disease is quick.

The affection has a disposition to begin above, and travel downwards; so that persons know very well which part of the mucous membrane is inflamed, at different times. When it is the mucous membrane of the frontal sinuses and nose, they say it is in the head; —they feel so heavy and stupid. Then that goes off, and they begin to cough. As it leaves the upper part, it generally increases in the lower; and then, after a tickling in the throat, and hoarseness, there is frequently pain down the front of the chest, and cough; and also more or less difficulty of breathing. After that the tickling of the throat is diminished. But though it travels downwards, it frequently mounts up again. Sometimes people are beset with it in all parts at once; but generally, if the disease be slight, you see it travel downwards; and if a person have a relapse, it will come again above; but then people say they have caught a fresh cold. The disease will last from twenty-four hours to some weeks; and sometimes it is the forerunner (as I stated before) of violent inflammation of the larynx, or of the bronchia. It is often the prelude to various active inflammatory diseases.

The common cause of this affection, is the application of cold,— especially when united with moisture, or when the body is overheated and perspiring; and more particularly when the cold is applied partially. Many persons have a common cold in a few minutes, if exposed to a draught; but they will bear exposure to the air without any such effect. Mere cold will cause it, without any subsequent application; because, when you sit in a room without a fire, when you ought to have one, the nose will begin to "run," before you go into a room with a fire. While you remain in the cold room, you begin to sneeze; and other symptoms of catarrh come on;—proving the action of the cold itself. Most probably the constriction of the skin being so great, the Schneiderian membrane passes into great activity. Change of residence appears to increase the susceptibility to the disease. Some susceptible people always take cold if they change their residence; and some will catch cold without leaving their beds.

The best mode of treatment, is to keep the body perfectly warm; —so as to get rid of the chilliness. It is usual to increase perspiration by wine and brandy, and other stimuli; but it is better to do it by caloric itself. The warm-bath, or a vapour-bath, is very good; and a local bath is also very proper; and when you are warm, plenty

of hot liquids, without any wine or brandy, are exceedingly useful. If you put wine and brandy into hot liquors, there will most likely be headache afterwards.

During this time a person loses his appetite; and therefore nature indicates that he should take but little food; and that little should be chiefly fluids, and of a weak nature. When a person has been ill for any length of time, one of the best modes of getting rid of the cold, is by perspiring through exercise. Exercise in the open air if possible; or good exercise, at any rate,—so as to produce considerable perspiration,—is one of the best remedies. But great care must be taken not to catch cold, when perspiration is induced; for if a person allow himself to cool suddenly, when he is hot, his last state will be worse than his first. Good brisk walking, or dumb bells, or battledore and shuttlecock, or skipping, are highly serviceable. The patient should be careful to keep himself warm afterwards; or he will catch cold upon cold, till the most serious effects are produced.

INFLUENZA.

Catarrh is sometimes epidemic; and then it goes by the name of *influenza*. We have numerous returns of this epidemic catarrh throughout Europe; and it is not confined to the human race; for horses, dogs, and cats, are all liable to it.

The symptoms are usually more severe than in common catarrh. When the disease is epidemic, it is not so slight as when sporadic. When epidemic, there is generally complete loss of appetite, great lassitude and debility, and a very severe cough. It will attack persons both *out* of doors and *in* doors indiscriminately; and also individuals at sea. Sometimes it affects every member of a family at once; and sometimes it affects them in succession. There was a very remarkable influenza in England, in the year 1782;—there having been one in the East Indies and China, in 1780. It appeared (as many epidemics do) to travel westward;—having made its first appearance in the east. Respecting that epidemic, it is mentioned that an East Indiaman (the Atlas) had its crew attacked, while sailing from Malacca to Canton; and when it arrived at the latter place, they found that the people had all had influenza there, about the same time that the crew had had it at sea. This was an argument against the disease being contagious; for if the people had it out at sea, and found, when they arrived at a distant part, that the inhabitants had had it about the same time, it shews that it must have been something atmospherical, and not anything communicated from man to man. There has been a great difference of opinion respecting the contagiousness of different epidemics of this kind. Some contend that this and that influenza is merely epidemic; and others, that it is epidemic through its contagious nature. We have had epidemics of this description, but I never saw any thing to make me believe that the disease was contagious; though I should be sorry to deny it merely because the cases that came under my

notice, did not appear to be contagious. You will find, in medical books, strong facts to shew that it is contagious; and then there are others, equally strong, tending to shew the contrary;—just as is the case with regard to cholera.

The epidemic influenza attacks people of all ages; but children less than others. Is is sometimes fatal to persons who have chronic disease of the chest. An influenza is sufficient to stir up inflammation, when it exists in any part of the body. When the disease is not epidemic, but sporadic, it lasts from a few days to a few weeks; and when it is strictly epidemic, it generally continues for a few months. What the cause of it is, I do not know.

BRONCHITIS.

When inflammation attacks the air-passages at large, and particularly those within the chest (the ramifications of the bronchia), and affects these latter very severely, the disease is termed *bronchitis*, (from *βρογχος* and *itis*);—inflammation of the bronchia.*

This is the most common kind of inflammation of the lungs. The far greater number of those who have what is called "inflammation of the lungs," have inflammation of the ramifications of the bronchia; so that there is nothing heard of now but *bronchitis*; whereas we formerly used to hear only of *pneumonia*, or *peripneumonia*. But since it has been ascertained that the inflammation which we every day see, resides in the mucous membrane of the bronchia, the term "inflammation of the lungs" has fallen into less frequent use; and we have instead the term "bronchitis." One portion of the substance of the lungs is made up of the bronchial tubes, and therefore the term "inflammation of the substance of the lungs" is very proper; because those tubes are an integral part of the lungs.

In this affection, which you see every day, the breathing is quick and shallow. To make up for the shallowness, the patient breathes quickly. If the patient breathe deeply, the mucous membrane is put upon the stretch so much, that it occasions great uneasiness. He is more comfortable when he takes a small quantity of air into the chest; but it must be accomplished more frequently than on ordinary occasions. There is frequently a sense of constriction of the chest, and of soreness about the larger bronchia. It is sometimes difficult for a patient to lie down; but in other cases he can do so perfectly well. There is every variation as to cough. In some persons you will see intense cough tearing them. If they even turn a little in bed, it shakes the bronchial membrane sufficiently to produce cough. Some cannot turn; some can scarcely lift their arms; —they cannot produce so slight a motion of the chest as that, without experiencing cough. In other patients the cough is by no

* We take this opportunity of observing, that "bronchia" is the *neuter plural*; and that there is no such word as "bronchiæ;" which we encounter a dozen times in a page of some works on pulmonary diseases. It puts us in mind of Dr. Graves's exposure of that classical Hospital, in which "Repetatur balnea" figures in the prescription-book.

means severe. If it be severe, people are confined to their bed; but if not, the motion produced by exercise makes the breathing more difficult.

From the first there is some expectoration. The mucous membrane cannot be so irritated, without secreting more than it should; and this expectoration may increase to a very great amount. If the inflammation become very severe, it diminishes again; but still the patient has more secretion than in health. If a person have a very active inflammation, the secretion diminishes; and then, when the disease declines, or degenerates into the passive or atonic form, the secretion may become immense. At first it is thin; but it soon becomes thick, and frequently of a very yellow colour,—so as to look almost like pus; only it is very glutinous; and, for the most part, swims in water. You may see it very black;—as black as if soot had been mixed with it; but there are various other shades;—blue, green, yellow, and white. This expectoration is not excessively tenacious. It is certainly viscid; but not so tenacious as when the air-cells are inflamed. In the latter case, the matter is so tenacious, that if a person spit into a vessel and turn it up, the expectorated matter will not run out, but will adhere to the sides.

From the violence of the cough, and the congestion, there is no longer a probability of the disease affecting the mucous membrane above. There is headache (and sometimes very violent headache) when the cough takes place. The headache is of that character, when it exists at all, that patients almost always describe it as "a *splitting* headache;" and sometimes there is drowsiness. There is great congestion in the head; and a more or less inflammatory state.

The pulse is accelerated. You may have it at 100; or even above that. As the inflammation affects a mucous membrane, the pulse is generally large and soft. It may be hard;—for there is a great variety in these things, but for the most part it is full, and rather soft; or, at any rate, not a *firm* pulse. There is not the softness of *debility*; but a pulse of no remarkable *power*. The skin is frequently dry; and, of course, the tongue is dry, and generally of a dirtyish white colour; and sometimes it is covered with a great deal of mucus. The skin, for the most part, is hot; and now and then you see persons sweat violently. The face too shews great congestion. General congestion probably takes place; for, in many cases, there is drowsiness and headache; and there is likewise redness and fulness of the face. At the moment of coughing, you see the veins of the temples and neck greatly distended, and the whole face become turgid. If the disease go from bad to worse, the patient cannot lie down at all. His face becomes livid, from the congestion. The lips become purple; and I have seen the face become really black;—of such a hue that I could not have believed it had been the result of bronchitis, if I had had it represented to me. It was as dark as when a patient has taken nitrate of silver, to a great amount; or where there has been a communication between the two ventricles of the

heart. The pulse, at last, becomes weaker and softer; and, at the very last, vermicular. The surface becomes blue; and both the forehead and chin are bedewed with a cold clammy perspiration. In this state of things, the expectoration becomes very scanty, or ceases altogether; not because it is not secreted, but because the patient is too weak to expectorate it; so that he may almost be said to be drowned inwardly by mucus. In cases which are left to themselves, or badly treated, it is said that dyspnœa comes on about the fifth or sixth day; and is followed by death.

If, on the other hand, improvement take place, the constriction is removed. The cough is not much diminished; but it does not hurt the patient as it did. There is copious expectoration. The pulse becomes slower and softer; without, however, becoming so soft as in health. The surface perspires; and the tongue becomes moist. Still, if the case be severe, there is a discharge of stuff which appears puriform. In other cases, the patient neither gets well nor dies; and then there is considerable expectoration. Still the pulse is kept up, and still it is hard. In consequence of the cough, he does not gain strength; but perhaps becomes more and more emaciated. He has night-sweats; and at the end of many months he may die, or get all but well; and then when he is exposed to a common cold, he may have difficulty of breathing, and more or less bronchitis; so that some persons who have been ill, will never be able to get through a winter without an attack of asthma;—that is, shortness of breathing.

Besides these symptoms, however, there are others which may be learned by the ear. If you listen to the chest of a healthy person, you hear at every inspiration and expiration a slight murmuring; and this is called the *respiratory murmur*. If you listen to the breathing of a child, you find it louder than in adults; so that it has derived the name of "*puerile* respiration," to distinguish it from the respiration of adults;—on account of the difference of sound with which it is accompanied. I believe this arises from the fact, that there are a greater number of air-cells in children, in proportion to the size of the lungs, than there are in adults. Now if the tubes through which the air passes, are altered in diameter, or if there are more contents in them than usual,—if instead of being only moistened, there be an *abundance* of mucus, and mucus of a different consistence to what it usually is,—you must suppose that there will be a difference of sound from that which is observed in health. As bronchitis is an inflammation of the inner surface of these tubes, you necessarily have a very different sound in this disease, from what there is in health. If you listen over the part that is inflamed, you hear, instead of the natural murmur, a sound both louder and rougher than usual; and if the inflammation be very great, you then have the sound so loud and rough, as to be a *snoring* sound;—as if some little animal were snoring. That is called the noise of "*sonorous* respiration," or "sonorous *rattle*." Some choose to use the Latin word *ronchus*; and some

say *râle*, and would not say *rattle* for the world, because it is not scientific. However, you have a rough snoring sound; something like the bass string of an instrument. Besides that, you frequently have a squeaking or shrill sound;—something like the chirping of a bird; and that is termed "*sibilous* rattle." It is frequently shrill, like the noise made by a grasshopper. One or both of these phenomena we constantly observe. Of course you do not hear them all over the chest; but only at those parts where the tubes are affected.

There is another peculiar circumstance in this affection; namely, that all at once, while you are listening, you will occasionally find the sound entirely cease; and, if you continue to listen, you hear it again as before; or if you make the person cough, you then hear the sound of respiration again. Now this is peculiar to this disease; and it arises, as is supposed, from a large tube becoming temporally obstructed by mucus;—so that its ramifications get no air; and, when the mucus be removed, the air enters as before. If you ever find the sound of respiration cease in a part, if you only make the patient cough, that is generally sufficient to dislodge the mucus, and the respiration returns. This is called by Laennec a pathognomonic sign of this disease.

If you strike over the chest, in old persons more especially, with the intervention of some solid body, you have a hollow sound. The sound is much increased if a piece of ivory be laid on the chest, instead of striking the bare chest. If you strike with a finger interposed, you have a loud sound; but a piece of ivory is one of the best things you can employ. When you have hydro-thorax, or a deposition in the lungs, of course if you strike the part, in lieu of a *hollow* you have a *dead* sound;—as if you struck the shoulder or thigh. In bronchitis the sound on percussion is not altered; if you strike over every part of the chest, you find it sound as in health. At the very moment at which you may cease to hear respiration at one part, if you strike that part you still hear a hollow sound; and for this reason;—although respiration is not going on, there is air there. There is no fluid collected, and no solidification of the lungs; but the air is there much as it is in health; and therefore, on striking, you have the natural hollow sound.

You have this *wheezing* (as we call these rattles in English), not only when the person is *speaking*, but in a much more marked degree when he is *coughing*. If you have a doubt about the nature of the disease,—as to whether it is bronchitis or not,—because you do not hear a wheezing in the chest,—such as sonorous or sibilous rattle —if you make the patient cough, you may then tell the nature of the case to a certainty. In coughing there is generally a more violent inspiration; and as soon as you produce that, it will have the desired effect. If you be not quite sure as to the nature of the complaint, therefore, it is always well to make the patient cough. You will also frequently find this disease at the back and root of the lungs, when

you will not find it anywhere else. In that situation, both in respiration and in coughing, sonorous and sibilous rattles are frequently heard, when they are heard nowhere else.

For the purpose of listening to the chest, in order to hear these things, some employ the naked ear; but it appears to me that it would be better to employ the intervention of a foreign substance, —of a piece of wood. I think if you only employ the ear, you cannot come on every part of the chest so frequently as you wish; and it is not so convenient. If the patient be a young lady, and you be a young gentleman, perhaps mamma will not be pleased at you laying your ear on the daughter's bosom; and if the patient be a greasy old fellow in the hospital, you would not like it. Upon the whole, therefore, I think it much better to employ a piece of wood. I do not think that persons who use the ear only, do so well as others. I have known such persons give extraordinary opinions; and a great many of them are not capable of saying which instrument is the best. When you listen to the sounds of respiration, it is always best to take out the plug; and it is advisable to have the hollow extremity placed on the chest; for the sound is much increased by it. There are instances in which you expect an excavation; and you must then put on the top. I need not say that, in most instances, persons can tell a case of bronchitis without this; but sometimes they cannot. Sometimes a patient will breathe quick, and the pulse will be quick; and yet you are at a loss to say what the disease is. Sometimes I have known it difficult to say whether the disease was in the chest or not; whereas, by listening to the chest, and making the patient breathe quickly and cough, the disease has been fairly made out. If you listen to the respiration, in a case where you suppose there is bronchitis, it is right to make the patient breathe as quick as you can; and you will then hear the sounds more distinctly; it causes still more full respiration. If you make him take a breath something between a common respiration and a cough, it answers very well. It is right to make him fetch a deep respiration every now and then.

With regard to the *treatment* of this disease, I shall not detain you five minutes; for the treatment is perfectly easy. You have only to bleed the patient well, and to follow it up by local bleeding. According to some, the latter answers better at the back, than at the front. I do not know that this is the case, but some say they have contrasted the two modes;—which is more than I have done. I have generally been contented with cupping at the front. Some say there is more advantage from cupping on each side of the spine; and others prefer the root of the lungs and the large vessels. I am quite sure that, in this disease, you will find mercury of the greatest use. I have had many cases that have yielded the moment the mouth has become sore. Or if you choose, instead of making the mouth sore, you will derive advantage from exhibition of tartar emetic in large doses; so as to keep the patient nauseated, and from time to time produce vomiting. Vomiting causes a great discharge from the affected parts; and therefore it is more useful than in any other inflamma-

tion. In many inflammations, it would be dangerous to practise vomiting; but in bronchitis many trust, next to bleeding, to the exhibition of full doses of tartar emetic;—a grain or more every three or four hours. However, I am not so satisfied with this plan, as with making the mouth sore; but if the patient do not go on so fast as you could wish, then you may give tartar-emetic afterwards. Nevertheless I am quite satisfied, that making the mouth sore is one of the most expeditious modes of cure. I need not say that blisters, low diet, and moderate purging, are also exceedingly proper. The treatment is that of common inflammation; and if it be well practised in time, and provided the patient be not the subject of chronic bronchitis, the treatment is easy enough. If the patient have *acute* supervening on *chronic* disease, your chance is slight; but even then the case must be treated on the same principles.

It is to be particularly remembered, that this disease will sometimes destroy life in the most insidious manner. I mentioned that it will exist without pain, and then it may be easily passed over; and I likewise mentioned that it will frequently exist with little cough,—not half the cough that you often have in common catarrh;—and then also it may be easily passed over. The patient is considered to have a little cold; but there is such prostration of strength, as surprises every body; and in three or four days the individual is past hope. I have known several cases of this description. This occurrence takes place particularly in those advanced in life; and therefore, whenever you are consulted by individuals near sixty, or who have passed that age, and you observe difficulty of breathing, the respiration hard, and the pulse quicker than it ought to be, it is well to listen to the chest, and find what disease he has. You may find the respiration to be sonorous, sibilous, or both; or perhaps mucous; and the patient may be labouring under excessive inflammation of the bronchia. You may hear these sounds in many parts of the chest.

This species of the affection is called "*asthenic* bronchitis;"—that is, the form of inflammation which is described as *atonic*; where the inflammation, however active, may be attended by no great strength of constitution; and where it very soon degenerates into passive inflammation, or the patient absolutely sinks. There is no power in the *system*; but the *parts themselves* are more or less inflamed; and at that time of life, with such a state of the constitution, the inflammation is sufficient to expend all the powers; and at the end of a few days the patient sinks. When a patient, therefore, in the decline of life, has a cold sufficient to make him call in medical assistance, it is necessary carefully to examine the breathing; and to observe whether it is frequent or not. It is also right to listen all over the chest; in order to ascertain whether there is not a pretty considerable degree of bronchitis;—considerable either in *degree* or *extent*; for sometimes it is inconsiderable in degree, but considerable in extent; and that is quite sufficient to hurry the respiration.

This is an unpleasant case to treat; and I have lost many such

patients in a winter. They are usually seventy years of age, or older; they have bronchitis; they cannot bear much bleeding; their powers are gone; and it is frequently vain to attempt to relieve them. All you can do is to bleed to two ounces; to bleed locally; to apply blisters; to get the mouth sore; and to give emetics; but you cannot do much with any thing. When you hear *sonorous* and *sibilous* rattle degenerate into *mucous* rattle;—if this be observed all over the chest;—if the patient's powers be gone, and he cannot lift himself in bed without aid, you will occasionally get him through, by good support, by wine and milk, and (according to the practice of some) by bark; but very frequently, in spite of all you can do, he will slip through your fingers. It is always provoking to lose a patient; but there is sometimes an especial reason for it; and you lose your credit, because you have not alarmed the family as you should have done. When old people are attacked with this disease in such an insidious manner, and their strength is all gone, it is very easy to offend the family by saying the patient has only a cold, when he is all but dead.

I have heard some old practitioners say, that these cases should be treated with bark and wine from the very first; and that they invariably cure the patient. One always doubts a man who says he cures *every* complaint, however excellent his plan may be. The powers have been prostrated, from time to time, by something or other; but after the first bleeding (with which perhaps, you cannot go far), and after blistering, and producing a slight affection of the mouth, or nausea and vomiting, it is necessary in a short time to support the patient well; and if there be any doubt about the propriety of going on with this strengthening plan, it is better to do so;—giving an emetic every day, so as to clear out the chest, and induce a free secretion; and during the rest of the day giving bark or quinine, and good nourishment, or even wine. In these cases it is necessary to procure rest by means of opiates, or narcotics, of various descriptions; but the essential thing is to cure the bronchitis. The bronchitis frequently comes on in an insidious manner, and is accompanied by no constitutional signs; but it is in old people that this particularly happens. We never see it in children, or in the middle period of life; but in those advanced in years we see it every day.

It is this form of the disease that has been called *peripneumonia notha*;—as if there were *bastard* peripneumonia,—not *real* peripneumonia; but I believe the word is used very indefinitely. Sydenham applies this expression to common bronchitis; where the head is ready to split, and where all the symptoms present are such as I described as common to bronchitis. We had better abolish the term "*peripneumonia notha*;" and remember that there is a disease of the air-tubes (that is, bronchitis) that may be *active*,—accompanied by strength; and must be cured by strong measures; and that sometimes it is attended by no strength at all; or, at least, that the strength will all go away in a day or two; and that whatever

measures are adopted, must be employed the first few days. I believe the term "*peripneumonia notha*" was supposed, by some, to apply to the latter state only; but if you read Sydenham, you will find it clear that he applies the term to those cases where there is considerable pain.

Speaking of the rattles, I should mention, that if the affected part be at a considerable distance from the front, you cannot hear them well. The nearer they are to the surface, the louder you hear them. Sometimes, if you place your hand over the chest, you discover a vibration at the same moment; but that is not always the case. It depends upon the extent, or the intensity, of the affection. If the air pass with great difficulty, it shakes that portion of the chest. However, it is not of very great importance.

Bronchitis is very frequently a *chronic* disease. Sometimes, and indeed generally, this is a mere degeneration of the acute form. In some persons, the disease, when it has once begun, however acute it may be, never ceases. At least, they have it every winter afterwards. I think I mentioned before, that another attack of the disease may not be *active*, but more or less *passive*; and some have the affection for two or three years; and then they die. But if you ask many asthmatic people (as they are called,)—that is, persons who have passive bronchitis every winter,—they will tell you that it came on originally after severe inflammation of the lungs, or a very violent cold. It is in the middle aged and the young, that chronic bronchitis is most frequently the consequence of a very acute affection. In *old* people it generally comes on very slowly; and is the consequence of what is apparently nothing but catarrh;—that is to say, a very slight acute attack of bronchitis, in old persons, degenerates into chronic bronchitis. In old people, too, it comes on very imperceptibly. They will perhaps have a severe cold one winter, and have it for two or three months; and then, the next winter, they will have it still worse; and so they go on, as long as they live;—having it worse and worse every winter.

This cronic bronchitis passes, vulgarly, under the name of asthma; and even among some medical men (especially those educated a long time ago) the term "*asthma*" is applied to bronchitis. Now asthma is, properly speaking, a pectoral difficulty of breathing. I say *pectoral*; for the causes of many difficulties of breathing, are situated in the larynx or in the windpipe. A spasmodic dyspnœa may be situated altogether in the larynx. Asthma, however, is purely pectoral. A spasmodic difficulty of breathing, such as true asthma, is frequently united with inflammation or congestion of the mucous membrane of the bronchia; that is, with chronic bronchitis; because when the mucous membrane is inflamed, it is commonly thrown into spasm; and unless it be removed, the muscles are also thrown into a state of spasm.

When the two diseases are united, they pass under the name of *humoral asthma*;—that is, spasmodic difficulty of breathing, with a great quantity of fluids in the chest. The "humoral asthma," men-

tioned in old writers, is nothing more than what I have now stated.

Chronic bronchitis is very frequently the cause of asthma. When a part has been frequently inflamed, it becomes excessively irritable, and at length spasm takes place; so that, when a person has chronic bronchitis, it is worse at one place than another,—it is worse at one *season* than at another; and the patient will be seized, all in a moment, with additional difficulty of breathing. You may sometimes have spasm without any inflammation of the bronchial tubes; but a common cause of spasmodic difficulty of breathing is certainly chronic bronchitis.

This chronic bronchitis, whether united with a spasmodic condition or not, varies in degree; from great congestion of the bronchial membrane, and of the whole lungs, down to a mere gleet,—a mere flux or gleet of the mucous membrane; in which state the mucous membrane may be red, or it may be without the ordinary signs of inflammation. You may have nothing but a mere gleet;—such as occurs in gonorrhœa when it has long gone by; and which, of course, does not deserve the name of inflammation. It appears to me (as I mentioned formerly) that, in the latter case, there is exactly the same state as we see in a serous membrane, where it pours forth a great quantity of fluid, but where you cannot discover signs of inflammation at all. On the contrary, the parts are whiter than usual, and have the appearance of satin.

In all these varieties of chronic bronchitis there is cough. There is also copious expectoration; and the expectoration is of all descriptions;—frothy, ropy, mucous, serous, watery, tenacious, and viscid, like gluten. Sometimes it is short and creamy;—just like pus; and sometimes it is absolutely purulent. These varieties of expectoration frequently exist, at the same time, in different proportions; and sometimes they succeed each other. The expectoration may be sweet and inodorous; or it may be dreadfully fœtid; but there is no danger from the latter circumstance. I have seen females with such a fœtid expectoration, that their sisters could not bear to sleep with them;—so fœtid, that, they were disagreeable to themselves; and yet no sign of danger whatever presented itself, and the patients did exceedingly well. They were going about without any particular ailment, except that they had a copious expectoration. In colour it will sometimes be bluish, sometime black; or it may be yellow, green, brown, or reddish. The latter is owing to the admixture of a little blood in it. Then, as to quantity, it may vary from a few ounces to two or three pints, in the twenty-four hours. The other symptoms vary in intensity. There may be dyspnœa, or there may be none at all. There may be merely cough and expectoration; but that is more particularly the case in what may be called mere gleet of the mucous membrane. When there is congestion of the lungs, or a spasmodic constriction, then you may have difficulty of breathing; and in other cases there may be such dyspnœa, that the patient cannot lie down;—such dyspnœa, that it will cause plethora of the head, face, and neck, distention of the

jugulars, suffusion of the eyes, and (I might almost say), blackness of the nose and lips, or even of the whole face. In such cases of extreme congestion the extremities may become cold and blue, and the urine scanty. The pulse may be either full, or small and feeble. In short, there may be all those symptoms which make many believe that hydrothorax has existed;—that, unquestionably, there has been water in the chest. It is in cases of this description that we are told, every day, by those who never employ their ears, that such a patient has water in the chest; and yet, on opening them, will find none at all, or not sufficient to explain the symptoms. I have frequently seen persons with all these severe symptoms; and yet, on opening the chest, there has not been a drop of water found in it; but I have found the lungs so congested with blood, that they would not collapse. On listening with the ear, all this was clear beforehand. Respiration was heard at the lowest part of the chest; whereas, if water had been there, you could not have heard it. On whatever side water exists, if the person be upright, there can be no respiration in the situation of the water; and on striking the part there can be no hollow sound;—on the contrary, the noise produced is like that occasioned by striking a solid, fleshy part,—like the thigh. Chronic bronchitis, therefore, may sometimes exist without any congestion of the lungs at all; or there may be the greatest degree of congestion.

This disease is very easily recognized, without auscultation; but the simplicity of the affection can only be determined by the aid of the ear. A person may easily say that another has bronchitis, whether it is acute or chronic; but without the aid of the ear, it is frequently impossible to say whether there is not something worse than bronchitis. Bronchitis may be frequently cured, or so reduced that little may be left; but there may be present another disease of a fatal character; and you may be able to ascertain this only by the ear.

In chronic bronchitis you may have the rattles of which I spoke in most, or nearly all parts of the chest; and they will be in different parts on different days. You may have different rattles on different days;—*sonorous* rattle one day, *sibilous* another, and *mucous* a third. The mucous rattle is seldom continuous. It generally arises from the presence of a great quantity of mucus; and if patients clear themselves well, (as they generally do), once or twice a-day, then the rattle ceases. In this, as in the *acute* variety of bronchitis, the respiration may occasionally cease in particular parts. It is by no means so frequently suspended as in the *acute* form of the disease; and some say that it *never* is; but occasionally it is lost; and then, for the most part, you hear it again.

That form of the disease which is characterized by great expectoration, and that of a character nearly resembling pus; which is attended by a little dyspnœa, but by no signs of congestion; and which is followed by emaciation; so that people waste, and at last become hectic;—this form is continually mistaken for phthisis; while on the other hand, that form in which there is congestion, is

mistaken for hydro-thorax. That species which is so often mistaken for phthisis, and passed by, may, if properly attended to, often be cured. This form, indeed, is better known by the *general* symptoms, than by the *peculiar* symptoms I have just mentioned. It is ascertainable by the ear, and by the absence of other symptoms of phthisis;—just as the congestive form of the disease is known, not only by passive symptoms, but by the absence of signs of hydro-thorax, or of disease of the heart, and so on. This form of the disease is known by the absence of pectoriloquy; and by other signs, which I shall hereafter mention.

I may state that you will find, in authors, various names given to this kind of affection. When it occurs in old people, it is called *catarrhus senilis*;—that is, a kind of bronchitis, attended with various degrees of congestion, and frequently none; but attended with gleet, and a great discharge; and as it occurs in old people, it is called "catarrhus *senilis*." But is nothing more than an ordinary affection of a mucous membrane;—that mucous membrane being that of the bronchia. Laennec considers it a particular form of chronic bronchitis;—a form more frequently attended with asthmatic complaints than any other. He says, that what is called "asthmatic spasmodic difficulty of breathing," most frequently arises from a kind of bronchitis in which the secretion is exceedingly viscid; and in which the mucous membrane is thickened and swelled,—particularly in the small branches; so that some of them are nearly blocked up; and in which the secretion is glutinous,—even firmer than pitch; and is disposed to form globules the size of hemp or millet seeds, semi-transparent, and of a pale grey colour. I have no observations of my own on this subject. I have not been able to verify Laennec's remark; but as he asserts it, it is worth attending to. Where we find asthma occurring, we ought to suspect that it is not a pure disease, but dependent upon bronchitis; and we ought to ascertain whether the expectoration possesses the characters just enumerated. He says that these globular bodies are seen in the expectorated phlegm; and that occasionally they are less consistent, and grow yellow; and sometimes resemble the vitreous humour of the eye. Such an expectoration is hardly noticed by the patient, in the midst of the common mucus which is secreted from the large branches; and which gives rise to so slight a cough, as not to merit his attention. He says the difficulty of breathing,—the spasmodic ailment, is almost the only thing of which the patient complains.

Here then is a *third* disease, which may be supposed to exist without chronic bronchitis; and which has continually been mistaken. Chronic bronchitis, attended by emaciation, may be mistaken for *phthisis*; where there is great congestion, it may be mistaken for *water in the chest*; but it appears that that particular form where there is an exceedingly viscid secretion, with small globular bodies, is continually mistaken for pure *asthma*. This is what Laennec asserts.

With regard to the treatment of chronic bronchitis, it is very va-

rious under different circumstances. Accordingly as the symptoms are inflammatory, and your patient strong, must your treatment approach to that for the acute disease; and accordingly as the patient is weak, and there are signs of *passive* rather than of *active* inflammation, so must you be careful in lowering the strength. In the latter case, when there are signs of *congestion* rather than of *inflammation*, and the powers of the patient are feeble, you may very easily conceive the great importance of not taking away a drop more blood than is absolutely necessary. Where you see the face black, the body bloated, the legs swollen, and only a small quantity of urine is formed, it may be necessary to take away a small quantity of blood; —perhaps a little from the jugular vein; or you may cup the patient between the scapulæ, and on the front of the chest; but the loss of more than a few ounces can seldom be borne. Diuretics and emetics are of the greatest utility. By diuretics you unload the lungs considerably. There is always a great collection of serous fluid in the air cells and tubes, and by diuretics you produce a great alleviation to the patient. It is a good practice to combine digitalis and squills together. You may give many diuretics together, when you cannot increase any one of them. When you cannot give the patient a larger dose of squills, without making him sick, you may add digitalis. It is certainly a very common thing for you to be able to give diuretics together, many of which have a tendency to produce sickness, without producing more sickness by the combination of the whole, than if you gave only one of them. The efficacy of a diuretic is generally thought to be much increased by giving a small quantity of mercury. This is an old remark; and I believe it is a correct one. You find it stated, that diuretics act more powerfully on the kidneys, if you give a small quantity of mercury with them, than if the latter be omitted.

You will also find great relief from the exhibition of emetics; and among the best is ipecacuanha. If you give antimony two or three times every day, you debilitate the patient; and this is not a case for diminishing the strength. You only want to unload the air-tubes; but antimony is a very depressing agent; and if given every day for a fortnight or three weeks, it may produce great irritation of the mucous membrane of the stomach (gastrodynia); and therefore I think ipecacuanha is the best. Patients will bear, not merely fifteen or twenty grains, but thirty; and it is a safe medicine. I am told that if you give a large quantity, it comes from the stomach, and produces no more effect than a small one. It is of great use to give an emetic every morning, or every other morning, and thus clear out the bronchia. It is an excellent remedy. When acute bronchitis has lasted a considerable time, and you do not think proper to evacuate, emetics may be repeated more freely;—especially in the case of children. When the case is not very severe, a nauseating dose of ipecacuhana, squills, and other things of that description, is very useful. Among the best expectorants are those which excite nausea. It is always necessary to attend to the bowels. If you do not, there

is still more congestion; but it is very dangerous to purge briskly. In these cases the powers of the patient soon sink; and it is better to trust to emetics and diuretics.

It is frequently of very great use to blister the chest; but the employment of tartar emetic ointment is rather a severe and cruel mode; and I have not seen that it is any better than an ordinary blister. Some persons are fond of dry cupping. There is no loss of blood in that operation; and yet there is a great determination of it from the inner parts. Besides remedies of this description, it is frequently necessary to employ others of a soothing nature. Among the best is hyoscyamus, or conium; which may be given night and morning. There is no rule for the dose of these; but you find you may increase them to a much larger quantity than you begin with. I have seldom found stramonium of much use in lessening the cough. It is not to be compared with hyoscyamus, or conium, or opium. Opium is one of the best things; but, in many of these cases, there is a great disposition to heaviness of the head; and opium has the inconvenience of confining the bowels; so that though it is a good medicine in the form of Dover's powder, yet it is not so good as hemlock or henbane.

You will soothe the air passages much, by making a patient inhale different vapours. Patients may inhale the steam of hot water; but one of the best modes is not to let them inhale the steam, but to have a vessel so contrived that the air they breathe comes through hot water. You cannot charge air with a dose of salts; but there are many things which may be taken up by the air, and which may be inspired in this way. You might make a solution of opium, or of extract of conium; and let the patient breathe through it. I have not much experience of it; but I have put hyoscyamus and conium into water, and have made the patients breathe it; and this has afforded great relief. Some persons have used prussic acid; and they say it has been productive of great relief. Chlorine may be introduced in this way; and I have seen it lessen the irritation. Some persons employ iodine; but it is right not to use more than one drop of the saturated solution of iodine. Some patients will bear three or four drops, but some will not bear more than one; and I have known some people who could not bear one drop, put into three quarters of a pint of water. It is right to begin with the smallest quantity; and never to increase it beyond what is borne without the least irritation. I had a patient in St. Thomas's Hospital, who laboured under chronic bronchitis; and who found great relief from breathing through tanner's liquid. Without taking any medicine, the tanner's liquid diminished his cough, and he became much better. People living in the neighbourhood of tanner's pits, often find their respiration improved.

You will find another description of medicine often useful. Where there is no fullness of the chest, but the bronchitis resembles phthisis; —where the patient wastes away, and has a tiresome cough, you will find tonics of great advantage. Where there is a disposition to dropsy, emetics and diuretics are proper; but where the patient is

more or less hectic, and is spitting up a great quantity,—a state which often occurs in young persons,—you find tonics of great use; and you find iron one of the best. There is an interesting case, in the first volume of the "Medico-Chirurgical Transactions," of a young lady supposed to be in a consumption; but by means of three grains of sulphate of iron, taken twice a day, she got well. I have had cases of that description without end;—where persons were supposed to be on the verge of phthisis; but where there was nothing but bronchitis. There were no signs of tubercles; but there was irritation of the mucous membrane; producing everlasting tickling in the throat.

DILATATION OF THE AIR-TUBES.

When chronic bronchitis has existed for a length of time, it is very common for something more than congestion, and a thickening of the mucous membrane, to take place; it is very common for the bronchial tubes to become *dilated.* Sometimes one, sometimes several branches, and occasionally the whole of the branches in one lung, will become so large, that those which naturally should admit only a fine probe, will have a canal equal to that of a common goose-quill, or even sufficient to admit a finger; and perhaps these dilated branches are seen spreading to others, not nearly so large as themselves. This is the consequence, in some instances, of chronic bronchitis; but whether it is that the particular tubes become hypertrophied, so as to grow to this diameter,—*grow*, in every sense of the word; or whether they become so distended with mucus, that they acquire this increased cavity, I cannot say. It is, however, by no means an uncommon occurrence.

There are two or three varieties of this dilatation. Sometimes you see it throughout the tube; and it may occur in one tube or several; and, not unfrequently, the coats of the tube are hypertrophied and indurated at the same time. Secondly, the tubes are sometimes only enlarged in one spot; and then a mere cavity exists.

It is occasionally so large, that it will contain a nut. In a third form, the dilatation will occur at intervals; so that there is a series of small enlargements. The pulmonary texture, on being cut into, appears as if it were swollen with a number of small red tumors; and the whole become filled with a puriform secretion. In this last form, the coats are said to be always thin; as though the dilatation had arisen merely from mucus; while, in the two first forms that I have mentioned, the coats are generally hypertrophied; and the dilatation appears to be the result of the hypertrophy. Hence it would appear, that this dilatation occurs sometimes from hypertrophy, and sometimes from a mere obstruction by mucus; and the result is that, in two forms of the disease, either the whole length or a part of the tube is dilated;—just as is the case sometimes with the heart; while, in the third form, there is a series like a string of beads; and the coats are exceedingly thin; as though the change of form resulted, not from hypertrophy,—for then the parts would not be

thinner,—but from simple distension. In cases of this description some other symptoms arise. The disease is attended with great debility; and the patient is broken-winded.

You may suppose that such an alteration as this, will give rise to some alteration in the sound of the chest. This is a matter rather of curiosity and of pathology, than of practical importance; but still, if any disease produce any symptom whatever, it is right you should know what it is; whether it will turn to good account or not. We ought to make it a general rule to go straight forward, and make as accurate a diagnosis as possible, whether we can do good or not; because, if it be not of practical application *to-day*, yet it may become so by-and-bye. We must not despise a discovery, because it is not applicable to practice. It is not usual to say,—What is the good of this, that, or other, till the time comes to turn the discovery to good account?

When small tubes are dilated, they approach nearer to the natural size of large tubes;—they approach nearer, of course, to the size of the trachea; and therefore, if there be any difference in the sound of respiration, in the sound of a cough, or in the sound of the voice, in the large branches, it ought to be the same when the small tubes become large ones;—and this is actually the case.

The sound which is commonly heard in respiration, in a healthy chest, (called "vesicular respiration"), it would be best to learn by listening to the chests of your friends. The ground-work is to be learned by listening to the healthy sounds of the chest; and therefore, even without patients, you may learn it of each other. Listen to your friend's lungs;—listen to your friend's heart; and, when you have learned the *normal* sounds, then only is it time to learn the *unnatural* sounds. If you listen to different parts of the chest of a healthy individual, you hear different sounds in respiration. If you listen to the lungs in general, you hear that minute murmuring which is called *vesicular respiration*; or, by Laennec, the *respiratory murmur*; but if you listen over those parts where you know there are large branches of the bronchia, you do not hear that *fine* murmur, but *rather* a rougher sound; there is not a distinct murmur,—a feeble crepitation; but there is a rough passage of air;—such as you may suppose will take place if air be traversing a pretty large tube. When it goes into a vesicle and out again, there is a minute crepitation,—scarcely to be called a crepitation; and it gives the sound of murmur; but if you listen over a large tube,—one of the divisions of the trachea, you hear a rougher sound. This is all I can say;—you must listen to understand it. Then, if you listen to the trachea itself, you have a still rougher sound;—merely from the tube being so much larger. The respiration heard in the chest at large, is called "*vesicular* respiration;" because it is the sound of respiration passing to and fro in the air cells. The sound in the bronchia is the "*bronchial* respiration;" and that in the trachea, is the "*tracheal* respiration."

You will hear *tracheal* respiration at the anterior and lateral parts of the neck. You will hear it at the upper part of the sternum;—

the superior sternal region. You will also hear it at the superior portion of the infra-clavicular regions,—just under the clavicle; and you will hear it at the cervical portions of the acromion region,—near the acromion of the scapula. In these situations you hear the sounds of respiration, which the passage of air through the trachea gives rise to.

You hear the sound which the large branches of the bronchia give, (called *bronchial* respiration), in the middle sternal region;—that is to say, below the part of which I have just spoken; and you will hear it to the right and left of it. Here you will find bronchial respiration;—the sound of air traversing the large bronchia; and you will hear it, in thin persons, between the scapulæ and in the axilla. You will hear the sound of air passing to and fro in the air cells,—(*vesicular* respiration), in every part except the superior and middle portions of the sternum. You will hear it to the right and left of these portions; in the axilla; between the acromia; between the acromia and the neck; and in the superior part of the chest, immediately below the clavicle. It is well for you to study this on each other's chests.

If it so happen that certain tubes are dilated, then you will hear, instead of the respiratory murmur which I mentioned, a sound approaching to that of the bronchia, and even approaching to that of the trachea. This is one of the chief signs of the bronchia being dilated. They may, as I have just said, be dilated to such an extent, as to sound very much like the trachea; but, in general, you have only *bronchial* respiration.

If you make the patient speak, and listen to different parts of the chest, you will have very different sounds, according to the part at which you listen. If you listen to the greater part of the chest, you hear nothing particular; but if you listen to those parts where bronchial respiration is heard,—that is to say, at the superior part of the sternum, immediately below the clavicle, and also between the scapulæ,—you will hear the voice resound very much. You will hear it re-echo. There is no better mode of expressing it than that. You hear a sound of considerable force; but you hear no such thing if you listen to other parts of the chest. This arises from these parts being situated over the bronchia. If you listen over the trachea, you have a loud sound. Indeed, you hear the voice rush through the tube; so that you have *bronchophony*, and what is called *pectoriloquy*. You may have an idea of what is meant by "pectoriloquy," by passing the stethoscope over the trachea or larynx of any adult person. You find the voice come through the tube to the ear, as if the voice were against the ear. The natural sound of the voice below the clavicle, at the upper part of the sternum, and between the scapulæ, is called *bronchophony*; and the natural sound on the larynx is called *laryngophony*.

If any of the bronchial tubes be very much dilated, so that *small* tubes attain the size of *large* ones, you will have over the former just such a sound as you have over the latter in health. You have

bronchophony at a part where it should not exist; and if the bronchial tube be dilated enormously,—nearly to the size of the trachea, so that it amounts to a cavity,—you will have the voice come through the tube into the ear;—you will have *pectoriloquy*; and pectoriloquy is neither more nor less than the same sound which you always hear, if you apply the stethoscope to the larynx. It must be a very extreme dilatation, however, for you to hear the voice come through the tube in this way. It is common to have such a sound as you hear in the *bronchia*; but to have such a sound as you hear in the *larynx*, is a rare thing. Indeed, there must be a larger dilatation than I ever met with. Such a dilatation occurs from time to time; but it is so rare that I never met with it. There are drawings of it; and there is no doubt as to the existence of the fact. In dilatation of the bronchial tubes, therefore, there is bronchial respiration and bronchophony; and if the dilatation be very great, there is tracheal respiration, and a tracheal voice. As you may suppose, the nearer the tube is to the surface, the more clear are these sounds.

DIMINUTION OF THE AIR TUBES.

Chronic bronchitis, however, will sometimes induce the very opposite state. Instead of causing the tubes to become *dilated*, it may cause their coats to become thicker; and the canal will thus be *diminished*, and not dilated. Sometimes there is lymph effused within; so that the tubes are completely obstructed. When lymph has been effused within, and the tube has been obliterated for the time, it has been called a *bronchial polypus*. It is nothing more than the same occurrence that takes place in croup;—that is to say, lymph is effused; only not in a tubular form. I once knew a case of gonorrhœa, which filled the urethra with lymph; which lymph was discharged in a tubular form. Where the bronchia have been obstructed by lymph, it has been an instance of chronic inflammation;—at any rate, not of *acute* inflammation.

In old books you will find it said, that nobody could imagine what was the matter with the patient; and that then such a mass as this has been spit up. In cases of this kind, you could tell what would be the auricular symptoms. At the obstructed part there would be no sound of respiration; and as soon as the lymph was spit up, there would be the murmur again. But without such a cause of obstruction as this, the tubes are sometimes blocked up. The cavity is obliterated by the sides becoming thickened and contracted; and then no respiration, of course, is heard at the part; and this want of respiratory murmur is permanent. In the case of acute bronchitis, it will cease (from a temporary obstruction of the tube) for a few hours; but coughing removes the obstruction, and you hear the sound of respiration again; but when the obstruction arises from a contraction of the tubes, the want of respiration is permanent.

DILATATION OF THE AIR-CELLS.

Chronic bronchitis produces a farther change, precisely of the nature of dilatation, of which I have already spoken. The minute tubes of the bronchia terminate, as you know, in the air-cells; and it occasionally happens that the air-cells are dilated by this disease. This has been called "*emphysema* of the lungs;" but I think it an improper expression; because by "emphysema" we mean the presence of air in the cellular membrane, where there ought to be no air. Now in this case there is no air in the cellular membrane,—no air in any place but where it ought to be; only the part which contains the air is too large,—contains too much.

These dilated air-cells attain, in general, only the size of millet-seeds; but here and there one may be seen the size of a hemp-seed, and even as large as a cherry-stone. When they are the size of cherry-stones, it is very probable that the air-tubes open into the cells; and that all the cells separating from the tubes, they are dilated into one common cavity. I should think this was the cause. You are acquainted with the anatomy of the air-tubes and air-cells; and therefore you are aware, that at the termination of each twig of the bronchia where it is as fine as a hair, the air-cells are situated all along it;—just like grapes upon a stalk. I think it probable that when a bronchial twig is dilated to a great size, the air-cells which separate from it, are dilated into one. Occasionally, those of the greatest magnitude actually project on the surface of the lung; and are so prominent as to form a large globular form externally. Sometimes they are as large as a walnut, and even larger. There is a preparation at St. Thomas's Hospital, where there is a tumor of this description on the surface of the lung. In extreme cases of this kind, you will see the edge of the lung quite translucent, and standing away from the body of the lung.

If the quantity of air be very considerable, the sides of the cells may crack; and then a communication is established between them and the cellular membrane; so that true emphysema is superadded. In that case, the tumor upon the surface of the lung may attain a very great size; and the air may, by pressure, be forced about. But notwithstanding that the cells occasionally crack, and that air escapes into the cellular membrane of the lung, still it is found, that it does not move about very extensively;—not so extensively as it does in other parts of the body.

If lungs with dilated air cells be inflated and then dried, (which I imagine is the best way of preserving them), the dilatation of particular air-cells will be seen, on cutting into them, to be more considerable than appeared externally. When the dilatation is considerable, and at the same time so extensive as to occupy the whole lung, you will find, on opening the chest, that instead of collapsing, it rebounds, and projects beyond the chest. A lung thus affected, necessarily sinks less in water than a healthy lung; and, on handling it, it does not crepitate in the usual way, but it gives such a sound as

would arise from the slow escape of air; and you cannot empty it as readily as you could a healthy lung.

You will find that the tissue of the lung is drier than in health; and that even the roots of the lungs have not the usual infiltration found in that part. The lungs resemble those of a reptile more than those of a man. You know what the lung of a frog is; and the human lung is reduced very much to that state. The lung of a frog has a large receptacle for air;—not the minute cells that we have; and on opening the animal, the lung escapes the boundary of the chest. When only one lung is thus affected, it has been seen to become so much more bulky than the other, as to push aside the mediastinum, if on the left side, and to produce an enlargement of the heart, if on the right side. Laennec has described this condition of the lungs far more acurately, and far more minutely, than any of his predecessors; but (as you may see from his engravings) it was well known to Dr. Baillie. Dr. Baillie speaks of an enlargement of the air-cells causing the lungs to resemble those of amphibious animals. He considers it probable that two or three cells may be broken into one; and therefore, although Laennec has the credit of having first described it, it is right that we should give Dr. Baillie his due. Dr. Baillie also remarks, that Sir John Floyer distinctly describes the disease, as seen by him in a mare; and he considers the remark as applicable to the human subject. "The bladders," says Sir John Floyer, "are either broken, and admit the air into the membranous interstices, or else they are over distended; like a hernia in the peritoneum. This will produce an inflation of the whole substance of the lungs; and that a continual compression of the air and blood-vessels; which will produce a constant asthma." He was aware of this dilated condition of the air-cells; and he describes asthma as occasionally caused by this over distension.

The causes of this over distension, and of the rupture of the coats of the air-cells, may be a violent inspiration and retention of the breath;—such as occurs in blowing a wind-instrument. It may be from a mere debility of structure,—a loss of elasticity; but the most common cause is occasioned by the want of a due expansion of the lungs. Whatever prevents any one part of the lungs from expanding, when the thorax expands;—whether it be a material obstruction of the bronchial ramifications; or a compression of them; or whatever else;—it will occasion those parts which remain dilatable, to keep dilated in a corresponding increased degree, in order to fill up the vacuum which the expansion of the chest occasions. When we inspire, we dilate the chest; and the air rushes down the trachea, and the lungs follow the dilated portions. If there be any part that will not dilate, then (I presume) other parts are over-dilated, to fill up the vacuum; and, in that way, those parts which we distend are *over* distended, in order to compensate for the want of distension in other parts; and when once over distended, they are often unable to recover themselves; just as is the case in other parts of the body;—the urinary bladder, for instance. I presume it is on this account,

that the dilatation of the air-cells is so common in persons labouring under chronic bronchitis;—especially where the membrane is most thickened; and where the secretion, if there be any, is tough and adherent, so as to produce obstruction. Such, at least, is the explanation which presents itself to my mind. Laennec, however, gives a different explanation. He supposes that the air which passes through the imperfectly obstructed tubes, in chronic bronchitis, cannot easily escape again; but there it remains, imprisoned in the air-cells, by a mechanism somewhat similar to the mechanism of the valves of an air-gun; and the succeeding inspiration introduces a fresh supply; so that the accumulation is very great. I cannot refute this explanation; but the occurrence of the facts upon which I ground my explanation, is indisputable;—namely, that in inspiration we dilate the chest, and the lungs follow; and that if one part be obstructed so that it cannot dilate, the other parts attempt to get more of the air, for the purpose of filling up the cavity of the thorax. Thus when one part is obstructed, another will become dilated; and Laennec, to prove his opinion right, should have shown that the dilated air-cells are those belonging to the tubes in which obstruction exists. That he has not done; and I conceive they are not those in which there is obstruction.

The existence of this state of the lungs,—morbid dilatation of the air-cells,—cannot be known without the use of the ear. Dr. Baillie, of course, knew nothing of the auscultation. It was not known or practised till after his time. But he says, with great truth, that when the air-cells of the lungs are much enlarged in size, persons have been remarked to have been long subject to difficulty of breathing, more especially on motion of the body. I believe, however, there are no symptoms at present known, by which this disease may be discriminated from some other incidental to the chest. The dyspnœa does not differ from the same symptom under other circumstances. It frequently occurs in paroxysms; and will continue for many years. But the pathognomonic signs are obtained from percussion and auscultation;—not from either alone, but from the union of the two; for if, when the air-cells are greatly dilated, you strike that part of the chest, a sound is heard exactly as in health, and perhaps even clearer; for owing to there being but little pulmonary substance there, you have a sound more hollow than even in health. This is the first thing which you must expect. Then, if you listen to respiration at the part, there is very little murmur audible. Instead of a number of minute cells, with air rustling in them, there are only two or three cells largely dilated; and therefore the air cannot rustle as before; so that you hear very little of the respiratory murmur. The air which is there, scarcely leaves the air-cells;—scarcely passes to and fro. The part is not expanded; and the consequence is, that there is very little motion of the air. But it is to be remembered that you *do* hear *some* respiratory murmur; and this is the distinction between the presence of air in the pleura, and the presence of air in merely dilated air-cells. If air exist in the pleura, there it remains;

and you have a more hollow sound than usual; but on listening, there is no respiratory murmur; for the air is in a state of stagnation. In the case of dilated air-cells, however, there is a little driven out, and a little drawn back again; and therefore there is a trifling respiratory murmur. In the one case there is none; but in the other there is some.

It is said that when this affection is extensive, there is another pathognomic sign;—the inspiration is made with a crackling sound; as if the air were entering, and distending lungs which had been dried, and the cells of which had been universally dilated. The lungs are drier in this state than in health; and when the case is very severe, the inspirations are attended with the sound I have just described;—a sound similar to that produced by blowing into a dry bladder. This has been termed by Laennec "dry crepitous rattle, with large bubbles." It is an odd appellation; but it gives you the idea of dryness; and therefore it is a "dry crepitous rattle;" and it gives you the idea of the bursting of bubbles, on the surface of fluid; and therefore he says,—"with large bubbles." These are extreme cases. I never witnessed one of them. If you reflect a moment, you will find no difficulty in remembering this. When the tubes are dilated, they approach to the size of the bronchia, and you must therefore have the same sound in the former that you hear in the latter; and if the air-cells be dilated, it stands to reason that you cannot have the same minute murmur, that you have when the air is passing into a thousand minute cells. It also stands to reason that you will have a clear sound there,—just as you have in health; because there is air there, as before; and if the dilatation be very considerable, you will have a clearer sound than before; because there is little else there but air;—little pulmonary snbstance. I need not say that nothing can be done, either for bronchial tubes or for air-cells that have fallen into this dilated state. The treatment will not vary from that proper for chronic bronchitis. You must treat the case on general principles.

PNEUMONIA.

Having concluded the subject of inflammation of the air-*tubes*, I shall now proceed to speak of inflammation of the air-*cells*. A large number of cases of inflammation of the lungs, are considered to be inflammation of the *substance* of that organ; but they are in fact nothing more than bronchitis. In by far the greater number of instances, it is not inflammation either of the air-cells, or of the cellular membrane; but inflammation of the bronchial tubes. Occasionally, however, we have inflammation (as it would appear) of the air-cells themselves. This, properly speaking, is *peripneumonia*. The term "*pneumonia*" is the name given to any inflammation within the chest;—even to inflammation of the heart and pericardium;* but the word "*peripneumonia*" is more properly applied to

* The word is not now used in that sense; and the term "*peripneumonia*" is very much out of fashion.

inflammation either of the air-cells, or of the cellular membrane around them;—whichever it may be. For myself, I have no doubt that the inflammation is seated in the air-cells themselves; and it is in this point of view I shall now speak of it.

The common, well-known symptoms of this disease,—those which are discernible without the aid of the ear,—are very much like those of bronchitis. There is pyrexia, general feverishness, rapidity of respiration, shallowness of respiration, cough, and expectoration. In bronchitis, you will recollect, I mentioned that there is a sense of constriction in the front of the chest; and a soreness (sometimes pretty considerable) in coughing; whereas in peripneumonia, if there be any thing, there is rather a deep-seated dull pain. This is sometimes confined to one spot; though, for the most part, this dull uneasiness is pretty much diffused, and, indeed, is frequently so very slight, that a diagnosis cannot be universally made from it. Then the dyspnœa, if people lie still, is by many persons scarcely complained of, any more than it is in bronchitis. Some persons labouring under bronchitis, will not allow that they have difficulty of breathing; neither will they in peripneumonia. Just as in bronchitis, there is frequently violent cough; but sometimes there is scarcely any;—the cough is infrequent and soft. There is, however, according to Laennec, a decided difference in regard to the expectoration. He considers that the expectoration, in peripneumonia, is a pathognomonic distinction; and points out the nature of the disease. He says that when, in this disease, the sputa are received into a flat and open vessel, they unite into so viscid and tenacious a mass, that we may turn the vessel upside down, even when full, without the sputa being detached; for although they may partially hang from the vessel's mouth, the great bulk still sticks to the vessel. Their tenacity is such, he says, that they vibrate like so much jelly; and the tenacity prevents the air-bubbles from breaking, though they are very numerous in this kind of sputa, and sometimes very large. The air does not escape, but forms bubbles; and for the most part, be they small or large, they remain.

I cannot confirm or disprove Laennec's assertion, from my own observations; but I think all will allow that we must look beyond the sputa, as well as beyond the general symptoms, for an accurate diagnosis of this disease.

For Laennec allows that the sputa are frequently not so viscid as all this; he allows that, frequently, they are of some shade of red or green; though for the most part they are but little coloured; and he allows that, frequently, they are almost destitute of air bubbles,—frequently a mass of mere mucus or pituitous secretion, with a few glutinous, and slightly tawny portions. I cannot but think, therefore, as he allows all this, that we ought not at all to depend upon the sputa for a diagnosis. Indeed, when the characteristic sputa do occur, as they continually do, it is very often only at the onset of the disease,—only for a few hours; and sometimes even then only in so small a quantity, as scarcely to admit of being collected.

The pathognomonic signs of this disease, are acquirable by the

ear only; but before considering them, it will be necessary to trace the appearances in the lungs after death, and the succession of the changes. This is an opposite course to what we usually adopt. Generally we speak of *post-mortem* appearances *after* we have done with the symptoms; but here it is necessary to reverse the order; for the symptoms are in accordance with the unnatural changes.

In the *first* stage of inflammation of the air-cells, the lung merely suffers an accumulation of blood; so that it becomes more solid and heavier than usual. It looks livid externally, and retains the impression of the fingers;—like an œdematous limb. On cutting into it, it is found to be of a deep blood-colour, and replete with frothy, bloody fluid; but still the lung is spongy;—still it crackles under the fingers. This is a stage in which, after death, you will find nothing but an accumulation of blood and serum. As the lung crackles after death, —as it contains air to the very last, you will expect to hear the murmur of respiration in these particular parts during life; and that is the case; and as air is admitted, you will expect to hear, on percussion, the usual hollow sound of the chest; and that likewise is the case. But the murmur which you hear when the inflammation has only reached the first stage, in that particular part, is accompanied (even from the very first moment of the attack) with a crackling sound. You have not the ordinary murmur of respiration; but it takes place with a *crepitous rattle*, as it is called; or, if you please, a crepitous *respiration*. It gives you the idea of numerous minute, and almost dry bubbles; and you hear this dry crackling the more decidedly, the nearer the inflammatory spot seems to be to the surface; and those who have employed their ears frequently, can from practice tell the exact depth of the inflammation, from the loudness of the crackling. The nearer the disease is to the surface, the louder it is heard.

When the inflammation has become more intense, (so as to constitute the *second* stage), the lungs are heavy; and they become so firm as to resemble liver; and on this account the term "*hepatization*" has been applied to this state; but really, I must say, very absurdly. The lungs are not changed into liver. If they were, it would be "hepatization;" but if they only remain as *solid* as liver, —something *like* liver, it is an improper word. By "*ossification*," we mean an absolute conversion into *bone*; and by "*hepatization*" we ought to mean a conversion into *liver*. If a thing is to be named in this way, because it is only *like* another, strange words might be applied to every thing. "Hepatization" merely means that the lungs have become as solid as liver; and Andral proposes another term,—"*solidification*;" which I think better. If the lungs have become solid, "solidification" is a correct term. In this state, where the lung has become solidified, it will not crackle under the finger; —it has evidently become impervious to the air. If you cut it, squeeze it, and scrape it, very little fluid escapes; and what does escape, is not frothy; neither is it so thin as that which escapes in the first stage. I presume that, in these cases, there is more or less

fibrine effused or deposited; and that is the explanation of the solidity;—the want of air, and the want of frothy fluid. When the lung has fallen into this condition, you may presume what the symptoms are. On striking that part of the chest where the lung has become so solid, of course you cannot have a hollow sound. There is no air there, as there usually is. There is no room for it; but there is a solid mass; and on striking over it, you have the same dead sound as if you struck over the liver. On listening to the part, as it contains no air, of course you cannot have the respiratory murmur; and having no murmur, there is no respiration; so that you cannot hear crepitous rattle. In the *first* stage you have crepitous rattle, because there is a thin fluid in the air cells; but here there is *no* thin fluid in the cells;—they are all solidified; and therefore there is no crepitous respiration. If, however, the part happen to be situated near a large bronchial tube, you will hear the patient's voice there;—on account of solids being better conductors of sound, than aeriform bodies.

Before death, however, a still further change will take place. Inflammation of the lungs tends to suppuration; and, at an advanced period, a *third* stage occurs. But there is a peculiarity in suppuration of the lungs;—the pus is *diffused*, and not collected into an *abscess*. After the second stage, when the third begins, the lung is as hard as before; but it becomes yellowish, or of a straw-colour. When the pus is first formed, in small quantity, there is quite sufficient to change the colour of the lung; but after a little time the pus becomes more abundant; the lung becomes soft; and will yield to the point of the finger. In this stage, just as in the second, there is no hollow sound on striking the chest; neither is there any respiratory murmur; but a loud mucous rattle;—that rattle which I stated you may have an idea of, by recollecting the sound occasioned by air passing through soap-suds. The mucous rattle is heard in the bronchia; either from some of the pus going into them, or a secretion from their own membranes.

Should an abscess be formed, however,—should the pus be collected into a mass, a characteristic symptom will be heard; such as I shall mention under the head of "phthisis." But such an occurrence is extremely rare. I do not recollect above twice seeing an abscess in the lungs, great or small, resulting from inflammation; and when I did see abscesses, they were small and full; and just as likely to be the result of a few distinct tubercles, which had existed in the lungs previously to the inflammation, as of inflammation itself. Some persons will have an old tubercle or two formed in the lungs, without inflammation. That is what we see continually. These tubercles may suppurate, and an abscess be formed; and if the lung fall into a state of inflammation, the solitary abscess may be ascribed to inflammation. So rarely is it the result of common inflammation of the lung, that I have only seen it, I am sure, once or twice; and then I cannot be certain that it was the result of inflammation, and not the result of previous tubercles. When abscesses do occur in

the lung, I am satisfied that Laennec is right in asserting, that they are almost always occasioned by the softening of tubercular deposition,—the softening of scrofulous deposit. "Among several hundred dissections of peripneumonic subjects," says Laennec, "I have not met with a collection of pus in an inflammed lung, more than five or six times. These were not of large extent; nor were they numerous in the same lung." * Even Broussais, to whom Laennec was in many points indebted, declares that he never saw ulceration in the lungs, without tubercles, more than once; and then the inflammation resulted from a musket-ball, which was tantamount to a tubercle. The reason assigned by Laennec for the rarity of an abscess in the lungs is, that the disease is either cured by art, or destroys life before it proceeds to the length of destroying the pulmonary tissue;—that death takes place before the disease advances so far, as for matter to be formed in the lung, in the form of an abscess.

This disease is frequently fatal when it is not of great extent; and when it has not passed the first of the three stages to which I have alluded. The first and second of these stages, are frequently seen in different parts of the same lung; and you may even see the third stage. You observe one stage going into another.

It is very remarkable that, in the greater number of instances, the inflammation commences at the lower part of the organ; and it may not extend higher. Consequently when the disease has advanced, it is in the lower part of the lung that the second or third stage is generally found; while higher up the disease may be only in the first stage, or entirely absent. The right lung, it has been asserted, is more frequently affected than the left. Of that I cannot speak; but I can speak to the fact of inflammation beginning at the lower part of the organ, in an infinitely greater number of instances than higher up. There can be no doubt that the membrane of the air-cells, and not the surrounding cellular tissue, is the seat of the disease. In the second stage of the disease, when the lung is solidified, but still red, if the structure be cut or torn, instead of the natural appearance of the cells, the inflamed part has minute granules, round or oval;—corresponding exactly with the appearance which the air-cells would give, if filled with a tenacious fluid, and solidified. Indeed, Louis found that, by forcing fluid into the bronchia, the same granular appearance might be produced by art; and therefore this granular appearance clearly arises from the air-cells being filled with the same tenacious fluid. The crepitous or crackling rattle also, I think, shews the same thing; for it is heard in another affection, in which this thick fluid evidently exists in the air-cells. In hæmoptysis, when bleeding takes place in the air-cells, the same sound is heard as in

* See his celelebrated Treatise, entitled,—"De L'Auscultation Mediate; ou Traité du Diagnostic des Maladies des Poumous et du Cœur; fondé principalement sur ce Nouveau Moyen d'Exploration." This work is principally known to the English reader through the Translation by Dr. Forbes;—a work which is enriched with many valuable notes.

peripneumonia. In hæmoptysis, this must arise from little bubbles snapping and cracking through this fluid; and as precisely the same sound is heard in peripneumonia, I think it is a strong argument to prove that the air-cells are affected by the disease; more especially when we see that a certain peculiar fluid is spit up in the affection.

Those rare cases of inflammation of the lungs which end in the existence of abscess, are marked by the same auscultatory phenomena, as occur when there is a phthsical excavation. You hear the sound come through the tube; and when the patient breathes, there is the sound of a cavity; and there is a metallic tinkling, of which I shall hereafter speak;—a noise as if a bell were struck with the point of a pin, or something very fine.

If, by art, the disease be remedied,—if the inflammation yield, of course the lung goes through the same stages as before, but inversely. The third stage comes to the second, and the second to the first; and it is found that the signs, audibly noticed by the ear, go through the very same inverted course. The auscultatory phenomena heard in the second stage disappear; and those which occurred in the first stage are heard again. Nothing is more interesting, certainly, than to trace the reversed order of the changes here. Suppose the disease has only gone into the first stage, you hear the hollow sound on striking as in health; and, on listening, you hear a crepitous rattle, and even a crackling. You cure the patient; and, as he is being cured, the crepitous rattle declines;—it becomes fainter and fainter every day; and instead of that, you have the natural murmur of respiration more and more distinct. Suppose the second stage has been reached, and you are successful;—in that case the want of a hollow sound, on striking the chest, gives way; and you hear, by degrees, a little hollowness of sound; and you hear it more and more every day; till that side of the chest sounds as hollow as the other. The respiration had ceased from the lungs having become solid; but you hear a little crepitous rattle, increasing every day, till you hear it as distinctly as in the first stage; and then, having arrived at the first stage, the disease passes through that entirely. You hear the crepitous rattle decline; and you have the natural respiratory murmur, becoming more and more distinct. I mentioned that, in the third stage, you still have no hollow sound; but you have a mucous rattle, generally from the entrance of pus into the bronchial tubes. This declines by degrees, if the patient get better; and then you gradually hear a crepitous rattle, from the cells losing a part of their viscid contents; so that they again admit a portion of air. The chest then regains its hollow sound on striking; and, at last, the crepitous rattle declines. Anatomical examination shows the changes of the part to be precisely correspondent with these auscultatory phenomena. When the first stage is recovered from, the lung is found to grow less red,—less turgid. Supposing the patient dies from intense inflammation of one part of the lungs, there is a lower degree in another part; and you find that is only in the first stage; but you are still able to make your observations there. You find, perhaps, that you have cured the in-

flammation at that one spot; that respiration is heard there more and more; while in another part it is heard less and less. But the patient dies; and, by examining different parts of the lungs after death, and having listened to them through life, you are able to trace the changes. When the inflammation of the third stage is being recovered from, the lungs become less turgid; and when the second stage is being recovered from, and the lung is going back to the first, the colour also becomes less intense; the texture becomes softer; the weight decreases; the organ, on comparison, affords more fluid; and the fluid becomes more and more of a frothy character. In the second stage, I mentioned there was a considerable granular appearance; this granular appearance now declines, and the vesicular character of the lung returns. When the third stage is recovered from, the yellow colour becomes lighter and lighter; the pus becomes more aqueous, less thick, and at length frothy; the accumulations of pus are reduced to mere specks; the vesicular appearance returns; the lung crepitates, and at length grows natural; and the little serous infiltration that existed is absorbed.

Notwithstanding that cases of peripneumonia are every day recognised, and the amendment or exasperation of the disease ascertained, by practitioners who never employ their ears;—as though nature had given us ears to be used on every occasion, except when we are practising our profession; yet the observation of the auscultatory signs, in the three stages of peripneumonia, is sometimes more than a philosophical observation,—more than an intellectual gratification. Many cases of inflammation of the lungs, I know, have been overlooked in the midst of other diseases; or have been totally mistaken. It is vain for those who obstinately refuse to avail themselves of the means given us by nature (in the sense of hearing) for learning the phenomena of disease,—it is vain for them to assert, that they can form an accurate diagnosis on all occasions; for these persons are perpetually lamenting, that medical evidence is uncertain; and, to my certain knowledge, they do frequently mistake diseases of the lungs for diseases of the heart, and diseases of the heart for diseases of the lungs. In the affection before us, (peripneumonia), if it suddenly supervene during a chronic affection of the chest, they continually ascribe the symptoms to effusion, to pleuritis, to dropsy of the chest, or to something else;—having no idea whatever of the real disease. In phthisis, an aggravation of the dyspnœa, unattended by pain, is very common; and is ascribed to effusion into the chest, or the bronchia, or the substance of the lungs; and, in chronic bronchitis, such an aggravation is ascribed to an attack of spasmodic asthma; when the simple trouble of listening to the lungs would show crepitous rattle; and prove that the difficulty of breathing arises from the presence of peripneumonia. In various fevers (eruptive and simple), in simple dyspnœa (without pain), during an attack of rheumatism and of gout, peripneumonia is continually overlooked; and some surgeons have stated, that after severe wounds and operations, peripneumonia will occur in the most insidious manner; and will not

be discovered till all possibility of remedy is over. Surgeons have lost patients under operations, after having suffered severe accidents, without knowing why; and, after death, they have discovered that the lungs were inflamed. This is a fact that you will find mentioned in many surgical books. All this mischief will be prevented by examining the chest with the ear, in every instance of dyspnœa whatever;—where there may be no pectoral symptoms at all;—no signs of any morbid affection of the chest; but where pectoral complaints are likely to supervene. This may be avoided by examining the chest, from time to time,—exactly as we feel it to be our duty, on other occasions, to ascertain not only the state of affected parts, but the state of the head, and of the abdomen.*

As to the *causes* of this disease, they are those of any other inflammation. I did not speak of the causes of bronchitis; because in both diseases they are the same. Cold is a common cause; and so are vicissitudes of temperature;—cold and heat, applied in the way which I mentioned when speaking of inflammation. Both bronchitis and peripneumonia supervene on the other affections of the chest. It is common, in diseases of the heart, for persons to be seized with one or the other, either in an acute or chronic form. Nothing is more common, than to see bronchitis and peripneumonia united with diseases of the heart and pericardium; and so nothing is more common, in diseases of the lungs, than to see these affections. In phthisis we have bronchitis, acute and chronic, and peripneumonia; and so in every other disease of the chest. Inflammation is frequently idiopathic; arising from a common cause; but sometimes it is symptomatic;—being the mere result of another disease of the neighbourhood.

With respect to the treatment of the disease, I shall not dwell a moment upon it. It is only the treatment of any inflammation. Patients have sometimes borne the loss of an immense quantity of blood:—perhaps more in this disease than in most others. It is in this affection that those enormous bleedings, which I have mentioned when speaking of inflammation in general, are reported to have taken place, a few gallons in the course of a few days. I have no experience of such bleedings as these. Mercury is of the same use in this affection as in the bronchitis; and in bronchitis as in other inflammatory diseases.

GANGRENE OF THE LUNGS.

You might suppose that if the lungs ever became gangrenous, it would be the result of inflammation; as gangrene so frequently is in other parts of the body. But I believe that the severest inflammation of the lungs seldom, if ever, induces mortification. Sometimes it may

* For an account of the different auscultatory signs mentioned here, and under the head of other Diseases of the Chest, beginners are referred to an "Introduction to the Stethoscope; with its Application to the Diagnosis of Diseases of the Thoracic Viscera. By William Stokes, M.D." A very good description of them is also given in a later work on Auscultation, by Dr. Spittal, of Edinburgh.

may be the case; but it is so rare that I have never seen it. The lungs will fall into a gangrenous state; and there is more or less inflammation attending it; but the gangrene does not appear to be the *result* of the inflammation. On the contrary, indeed, when nature makes an attempt to get rid of a gangrenous spot, inflammation is induced all around, in order to discharge it;—so that the inflammation is sometimes the result of gangrene.

In my own practice I have only seen two cases of this disease. They were of a different kind; and completely illustrated what Laennec has advanced on the subject. On some points Laennec has brought our knowledge to perfection. In some cases nothing has been done since his time; and perhaps nothing *will* be done. In one of these cases, in my own practice, the gangrenous part was uncircumscribed. A large part of the lung was of an unnatural colour;—dark greenish, moist, and soft; and in some spots it was a mere putrid pulp;—little more than so much mud; and of an insupportable odour. In those parts of the lung which I saw, that were not in a gangrenous state, the organ was firm, and of a chocolate colour, or a deep green. These appeared to be the three stages of the complaint. There was one part a chocolate colour, or deep green, and quite firm; another part was moist and soft, and of a dark green; and the third part formed a perfectly putrid, soft, muddy mass. A large portion of each lung was in this condition;—in one of the three stages of this affection. In another case which I had, the gangrene was in more circumscribed patches or spots. There were patches of the lung, black, soft, moist, and offensive in the worst spots; and in other parts, where the lung was still firm, it was of a green hue. No attempt, in this latter case of mine, had been made by nature to effect separation; but Laennec mentions that a gangrenous piece sometimes detaches itself, or is detached from, the surrounding parts;—just like a slough from caustic. That is an apt illustration of the appearance; because although the patches in my case were not separated, yet, if they had been, such would have been the state. The gangrenous part becomes dry and shrivelled;—just like a spot to which caustic has been applied; or it degenerates into a putrid paste like mud. The surrounding structure is inflamed; as in other parts of the body when nature attempts a separation. When a dead part separates from the living by inflammation, you know that the latter ends in ulceration; so that the dead part is left without any connexion with the living. The living part disconnects itself; the dead part becomes isolated; and is afterwards separated. If nature succeed, as she does sometimes, a cavity is often found where the gangrene existed; and this cavity has a lining membrane. Sometimes no cavity is left, but a cicatrix is formed; and the whole appears to have grown up together. This appearance has been perfectly well described by Laennec, and by others. In some instances, the separated portion makes its way into the pleura, and pleuritis is induced; and pleurisy, with effusion and pneumathorax, are the consequences.

In my two cases, the disease was marked by a sudden prostration of strength; a cadaverous alteration of the face; great feebleness of pulse; and an intolerable fœtor of the breath and sputa. One of these cases occurred in a man, who had long suffered from a loud hollow cough, with a copious frothy expectoration. The other occurred in a woman, who laboured under an encysted tumour of the pancreas. In her case a slight cough came on, which attracted no attention; and at last symptoms of gangrene appeared. These general signs will point out the disease, I imagine, much more than auscultation; but it is evident, that the gangrenous part must have less respiratory murmur than natural; that the part around will afford crepitous rattle, and that the cavity will give rise to pectoriloquy. If inflammation be set up for the removal of the slough,—causing the bronchial tubes to be affected,—there will be a metallic tinkling; but I imagine that far better evidence than this will be derived from the aspect of the patient;—from the cadaverous look, and the great debility; together with the intolerable stench both of the breath and the sputa.

When a part has become gangrenous, of course there is no hollow sound on striking the chest; and no respiratory murmur; but that may arise from a thousand causes; and if there be any inflammation around the dead part set up to cause its separation, there will be a crepitous rattle; but no one could tell that this resulted from gangrene, rather than from anything else. There are, however, certain signs observable by the other senses, which alone would make you believe there was gangrene; and these, together with the stethoscopic signs, make the thing pretty certain. Sometimes the sputa, in this disease, are white and opaque at first; but they grow sanious, purulent, brown, and greenish; and they are, from the first, nearly as fœtid as when the fœtor becomes gangrenous. We all know the fœtor of a gangrenous part; and before the sputa have that peculiar fœtor, they are nevertheless fœtid enough. This, however, cannot be much depended upon; nor can the fœtor of the breath. I have seen other diseases attended with extreme fœtor, but without gangrene; and I have seen extreme fœtor of the breath and sputa, without any danger whatever. Sometimes, in bronchitis, the fœtor both of the breath and sputa will be extreme. I mentioned having seen a young lady, who was in tolerable good health, except that she spit up a little; and this expectoration was horribly offensive; so that to stand near her was extremely unpleasant; yet she was walking about, and looking well. I saw a case of this fœtor of the sputa, and smelling of the breath, in a person who died of phthisis. Occasionally the matter formed in phthisis is of such a quality, that the fœtor is much like that of the fæces. There is no danger *necessarily* from the extreme fœtor of the sputa; neither is there necessarily gangrene; but if, conjoined with this, you observe that the sputa are bloody, brownish, or greenish,—something like the discharge from a sloughing part; and when you observe anything like little green fragments of lymph, together with a weak pulse, an elongated countenance,

and a cadaverous aspect; and when the patient is in the state in which you see people when they are sinking from mortification in any other part;—then there can be no doubt of the nature of the disease. But the mere putrid smell of the breath, and of the sputa, certainly ought not to make you conclude that the patient must have gangrene of the lung; or, indeed, be in any danger. In the two cases of this disease which I had under my care, the persons became, in a few days, very much emaciated. The pulse suddenly fell; the temperature declined; and the countenance expressed the most extreme exhaustion; but, at the same time, I must honestly tell you, that I had no idea, in either case, of gangrene of the lungs; and was much struck with the appearance after death; I could then compare it with the symptoms I observed during life. One patient had had chronic bronchitis for a long time; which bronchitis appeared sufficient to kill him; and the other was dying of the disease of the abdomen; and complained of a trifling cough, which had not attracted my attention. They were hospital patients; and it was only when opening them, that I discovered the disease. I smelt something very horrible when near them; but I ascribed it to another cause. When gangrene does exist in the lungs, it is not necessarily fatal. There have been cases clearly of gangrene of the lungs, which have been recovered from; though all the symptoms I have mentioned occurred. Nature is sometimes sufficient, when supported by good nourishment, to get an individual through an affection of this description; and to cause a separation of the gangrenous part.

There is nothing peculiar in the treatment. You must support the strength of the patient, as in other cases, where there is an absence of inflammation, and the presence of extreme debility.

HÆMOPTYSIS.

There is another disease of the substance of the lungs, and of the membrane of the air-cells; which, after death, presents very much the appearance of inflammation; and before the time of Laennec, was frequently, no doubt, mistaken for inflammation. This disease is the effusion of blood into the air-cells; and I shall now, therefore, speak of hæmorrhage from the air-passages (called *hæmoptysis*; from αιμα, *blood*, and πτυω, *to spit*). This will be in conformity with the plan I have hitherto pursued; namely, that of speaking first of inflammation, and then of certain other affections; among which is hæmorrhage.

This hæmorrhage may proceed from the mucous membrane of the air-*passages*; or from the air-*cells*. In the one instance, it is not necessarily a dangerous disease; in the other it is highly dangerous, in as far as it is likely to be very profuse. The greater number of cases of hæmorrhage from the air-*passages*, arise simply from an effusion of blood from the mucous membrane of the bronchial tubes. The blood which is spit up is florid,—generally of a bright scarlet colour; and it is frothy. It is spit up with a tickling in the throat; the pulse is quick; and there is heat in the chest. This is the description of hæmorrhage, which takes place most frequently in

young adults; between the age of puberty, and the full adult period of five-and-thirty. It occurs, particularly, in that period during which the chest expands,—in which we "spread," as they say. The first part of life is disposed to hæmorrhage from the *nostrils*; the second hæmorrhage from the *lungs*; and the third to hæmorrhage from the *abdomen*.

The disease, in general, is easily made out. The only difficulty is to distinguish between it and hæmorrhage from the stomach; but the latter is usually marked by a discharge of *black* blood. The blood is either discharged from the veins of the stomach; or it lies in the stomach so long after its escape from the vessels, that it acquires a venous hue. From the one cause or from the other, blood, when discharged upwards from the stomach, is generally black; and has also generally lain there long enough to be coagulated;—it is in clots, larger or smaller. Frequently, too, it appears in the fæces;—it passes through the pylorus, and you see it in the motions. Besides that, it frequently comes up with the food, —with the contents of the stomach; and, when it does not, still it comes up with sickness and nausea, if not with downright vomiting, You know that people may have a discharge from the stomach without vomiting. Sometimes a quantity of fluid comes to the mouth, and even portions of food come up without vomiting; and so it is with the blood. Occasionally, however, it comes up with decided vomiting. There is frequently a great uneasiness about the præcordia, and a fulness about the liver and stomach. These symptoms are all absent in hæmorrhage from the lungs. The blood, too, is florid; and, instead of being mixed with food, it is frothy; and is necessarily mixed with air, in consequence of the parts from which it comes. These parts will not allow it to stay so long as the stomach; and it generally comes up as soon as it is poured into the passages; and therefore it is seldom coagulated. Occasionally, however, you do see a little coagulum; for it will sometimes lie sufficiently long to become solid and black, before it comes up. In addition to this you have pectoral symptoms in hæmoptysis. In the stead of nausea and vomiting, you have a stitch in the side, a little cough, and a tickling in the throat.

This species of hæmorrhage occurs more particularly in those persons disposed to consumption; with a fine soft skin, soft hair, and a sanguineous temperament; and, among these, it occurs more particularly in those who have a florid colour. The disease sometimes occurs in those who have evident signs of inflammation; sometimes it occurs where there is hardly anything particular to be perceived about the individual; and sometimes it occurs in those, in whom there appears to be great strength of system.

It is produced by all the causes of inflammation. A blow on the chest, or catching cold, will give rise to it; but it very often takes place without any observable exciting cause. Violent exercise, and excitement of mind or body in any way, will occasionally produce it; but sometimes it occurs without any apparent cause. It will return

at certain periods,—at intervals of a month or a twelvemonth; and at last it will cease altogether; and the patient will then become the subject of consumption. It is very common for consumption to take place in patients who have had several attacks of spitting of blood; but this is not a necessary occurrence. I know many persons who expectorated blood, fifteen or twenty years ago; and they are now as well as I am. If a person spit blood, he should avoid every thing which causes an irritation of the chest; but he ought not to condemn himself; for I have known persons spit a considerable quantity, again and again, and yet afterwards do perfectly well. If you listen to the chest, when the blood is in the air-passages, you will hear sibilous and sonorous rattles. When these patients die, and you examine them, you find nothing unusual. If you examine a person who has died of phthisis, and who expectorated blood before there were marks of phthisis, there will be found nothing to account for the hæmorrhage. It is a mere effusion from the mucous membrane; which will pour out blood without a rupture of the large vessels. Small ones will sometimes throw out a gush of blood. When speaking of hæmorrhage in general, I mentioned that you will sometimes open persons who have died of hæmorrhage from the stomach and intestines, without being able to find a vessel ruptured. It was clearly an effusion from a thousand minute orifices.

Sometimes, however, hæmorrhage from the lungs is not of this description;—does not take place from the mucous membrane. It is a particular disease, occurring in the air-*cells*; and in that case the hæmorrhage is generally very profuse;—far more so than in other cases.

On examining patients after death, (for they frequently die of the disease in this form), you find that certain parts of the lung have become exceedingly hard; and, if they be near the surface, you see the lung through the pleura looking very dark. The lung looks variegated; and there are large black patches here and there. If they be deep in the substance of the lung, you cannot discover their extent; but on taking hold of the lung, you feel hard patches;—some as large as nuts, and some as large as walnuts. On cutting into them, you find they are very red, and of a deep colour; and no doubt, in former times, they have been mistaken for so many large circumscribed inflammations. These parts of the lung may be from one to four cubic inches in extent, and even much larger than that; and the redness is a deep damask hue. Nay, it is sometimes so intense as to be black;—as dark as a black clot of blood. This portion of the lung is not only hard but heavy; and it will not crackle under the finger.

On cutting a portion of the lung in this condition, you observe the same granular appearance which, I stated, takes place in inflammation of the substance of the lungs. In inflammation of the air-cells, before the part is completely solidified, it has a granular appearance; which no doubt arises from blood being effused into the air-cells, and there coagulating. The blood coagulates in each air-cell; the

minute coagulum of each cell becomes a little grain; and furnishes this granular appearance. The diseased parts are usually quite circumscribed; so that the surrounding portion of the lung is in every respect healthy. In inflammation of the substance of the lung, the diseased appearance is gradually lost in the healthy lung; but in this disease, in almost every instance, the affection is entirely circumscribed; so that within a hair's breadth of it (I might almost say) the lung is perfectly healthy. The case is really one of severe ecchymosis; only that the blood is effused, not into the cellular membrane, (as it is in ecchymosis of the surface of the body), but into the air-cells. That the blood is effused into the air-cells, and not into the cellular membrane of the lungs, is proved, as I mentioned, from the circumstance that the blood is spit up. If the blood were not in the air-cells, but in the cellular membrane, it could not be spit up.

The great symptom of this affection, during life, is spitting of blood. Besides the symptom of repeated and copious hæmorrhage, you have cough; difficulty of breathing; heat in the front of the chest; flushing in the face; and at length great paleness of it. There is also a tickling sensation in the bronchia; just as when hæmorrhage comes from the air-passages. You cannot tell whether the blood comes from the mucous membrane, or from the air-cells, by any of the *general* symptoms; but when it is effused in a very large quantity, there is a *probability* that it comes from the air-cells. It is said that as much as ten pints of blood have been discharged from the lungs, in this way, in forty-eight hours; and Laennec says that he has seen thirty pints thus spit up in fifteen days.

The disease may exist in so slight a manner, that no external hæmorrhage takes place. I have known this state of the lungs to occur, without any spitting of blood. The blood has been effused into the air-cells, and coagulated there, and produced the hard lumps I have described; and not having been followed by subsequent attacks, no blood has been expectorated. Old persons, who were never known to have spit up blood, have died from other diseases; and this appearance has been found in their lungs.

Laennec has termed this disease *pulmonary apoplexy*. As this lesion evidently results from sanguineous exhalation into the air-cells, and perfectly resembles the cerebral sanguineous exhalations which produce apoplexy, he has thought it right to designate it "pulmonary apoplexy." Now I think you will agree with me that this is an exceedingly absurd name. So far as there is a great local congestion of blood and effusion, the phenomena are the same as are observed occasionally in apoplexy. But apoplexy is not a state of parts. It is a loss of sense and motion; occurring, for the most part, suddenly. Apoplexy is a stroke that causes persons to fall down senseless and motionless. In the words of Cullen, "Motus voluntarii fere omnes imminuti; cum sopore, plus minus profundo; superstite motu cordis et arteriarum." That is what we mean by "apoplexy." If a person be said to have apoplexy, and you ask the individual how he knows it, the answer is,—"He has lost all sensation and power of motion.

There he lies in a dead state; and you cannot rouse him." Apoplexy does not consist in the morbid state of the brain; but in the symptoms which we observe; and those symptoms will take place from depression of bone, or from an effusion of fluid. Any thing which compresses the brain will produce, not congestion of blood, but a loss of sense and motion. Nothing of this kind, however, occurs here. There is no loss of sense or motion in this disease; and therefore it cannot be apoplexy. Merely because apoplectic symptoms arise from a congestion of blood in the brain, or from hæmorrhage into it, Laennec has thought proper to call this state of the lung "apoplexy." Apoplexy will frequently arise from a secretion of pus pressing upon the brain; or from a secretion of mere serum;—without any congestion,—without any fulness of the vessels. This is the case when part of a vessel becomes ossified; so that it splits across, and allows the blood to escape into the brain. Thus you may have hæmorrhage without apoplexy; and you may have apoplexy without congestion,—without hæmorrhage. I cannot but think, therefore, that it is an extreme abuse of terms, and likely to cause great confusion, to call this disease "apoplexy of the lungs;" for there is no resemblance whatever between it and apoplexy,—properly so denominated.

It is not long that this disease has been known. Dr. Forbes, in his translation of Laennec, mentions (in a note) that, "in 1816, M. Léveillé appears to have read a memoir on this subject before the Academy of Sciences at Paris; and, in 1817, Dr. Hohnbaum, of Hildburghausen, published three cases of sudden and fatal effusion into the substance of the lungs." He says, the lungs were found distended with dark-coloured blood, partly coagulated and partly fluid; and were almost too large for the chest. In one case, the same kind of blood was found in the bronchia; and in the other in the pleuræ. The cases appeared to be nothing more than a laceration of the blood-vessels; and the patients appeared to die from the effects partly of internal hæmorrhage, and partly of oppression of the lungs, induced by the effusion of blood. They died of syncope and asphyxia. Dr. Forbes formerly described such a case, in his translation of Avenbrugger. From the suddenness with which it occurred, and its appearing to arise from a laceration of the vessels of the lung, producing congestion, Dr. Hohnbaum gave the name of "pulmonary apoplexy" to this particular case. But we must consider that neither sudden death nor effusion constitute apoplexy; for apoplexy is nothing more than a loss of sense and motion. In apoplexy the motion of the heart may continue; but volition has ceased, partially or entirely. There can be no doubt, however, that Laennec was the first *on the Continent* who gave a full and accurate account of the disease; which he did in 1819. The disease was really not understood fully, till Laennec wrote upon it at that time; and he then pointed out the common connexion of this particular state of the parts, with profuse hæmoptysis. Yet it is singular, (and you will excuse my mentioning it, since there was no merit in it),

that I myself published an account of this affection, and gave the symptoms during life, and the appearances after death, some two or three years before that. I had a patient who died of profuse hæmoptysis, which I could not stop. I stopped it for a time, but it came on again and again; and, as he sank, I examined him after death; and found, to my astonishment, the appearances of the lung which I have described to you. I found on the surface of the lungs, numerous hard, circumscribed, dark patches; and, on cutting into them, I found hard solid lumps, of a deep chocolate colour. There were many of them in the lungs. I cut these lumps into slices; and found that they admitted the light through them;—just as a clot of blood will do, if you cut it very fine.

The case (which will shew the course of the disease very well) was that of J. G., aged 35, by business a gardener;—a mild and extremely steady man. He had laboured for two years under dyspnœa, pyrexia, cough, pain of the chest, and bloody expectoration. At length, profuse hæmoptysis came on. Various remedies were prescribed, but in vain; and he ultimately died exhausted. On opening the body, the surface of the lungs presented numerous hard, circumscribed, very dark patches, of various sizes,—from that of a sixpence to the size of a crown. A person not of the profession, would have supposed them so many mortifications. Blood, however, when accumulated in the small vessels, often causes (as Dr. Baillie has pointed out) a counterfeit appearance of mortification in the stomach and intestines, and in many other parts. Such was the nature of these patches. On cutting perpendicularly through them, the hardness and dark colour were found extending into the substance of the lungs (an inch or less); in a form equally circumscribed as on the surface. The intervening spaces were perfectly healthy. This Laennec also remarked. Nearly the whole of the inferior lobe of the right lung, had undergone the same change as the circumscribed portions in the other lobes. This change consisted in a prodigious congestion of blood, which could not be squeezed out, and which gave the dark colour and hardness. The slices were quite diaphanous; and of a beautiful red colour. No other change,—no disorganization, was in any part discernible. It seemed as if the most minute vessels in various parts, had become dilated, as in nævi materni; and had thus allowed the escape of the blood. Had the symptoms been those of acute inflammation, and the blackness not been in detached portions, there would have been nothing singular; nor would there had the disease been simply chronic inflammation; indicated by a frequent pain at the anterior and lower part of the chest, always yielding to blisters, and a large quantity of bloody fluid found in the cavities of both pleuræ after death. But it is surprising that this should occur in patches; and should have induced no suppuration,—no disorganization; but merely hæmoptysis and pain.

There was no great discovery here. I opened the man; the appearances were provided for me; and I described them. I pride

myself on one thing;—that I did not call it "apoplexy of the lungs." I gave it no name. The work in which the case was published, was called the "Annals of Medicine and Surgery;"* and I made an extract from it in my work on Disease of the Heart;—the original publication being now very scarce.

The employment of the ear, in addition to the general symptoms, may be useful in this disease. It is always desirable, when a person spits blood, to know how much disease exists in the lungs; and it is desirable to know whether the blood comes from the bronchial membrane, or is the consequence of such a state of the air-cells as we have noticed; because the latter form of hæmoptysis is far less manageable than the former. In this kind of hæmoptysis (called "pulmonary apoplexy") when only a little effusion has taken place, you have a crepitous rattle; but in hæmoptysis from the air-tubes you have not; and for this reason;—the blood is not in the air-cells. When it is in the *tubes*, you have no crepitous rattle; for that always arises from an accumulation, of some kind or other, in the *cells*. In effusion of blood in the air-cells, you have crepitous rattle *at first*; but where the blood is more *abundantly* effused, you cannot have crepitous rattle; because no air can be admitted. The crepitous rattle, I have no doubt, arises from the air passing through the fluid; and from the air-bubbles bursting one after the other. When so much blood is effused into the different air-cells, that no air can be admitted into them, and the part becomes firm, there is no crepitous rattle, nor any rattle at all. No respiratory murmur, and no morbid respiration is heard; for no respiration can take place long in that part. All that you can detect by the ear is, that the part is not healthy. On striking over the part, you find it sound dead; and on listening you find no sound of respiration; and you learn very well, by the ear, what is the extent of the mischief. In the case I met with, the whole of the inferior lobe of one lung had undergone that change;—had become quite solid. In those days the stethoscope was not invented. A work on this subject, which I shall have occasion to mention, was neglected; and I was never taught to use the ear; and therefore I knew nothing of the symptoms that would have presented themselves, if I had employed that organ. But if I had employed the ear in that case, no respiration would have been heard over a great part of the chest; and on striking there would have been no hollow sound; and therefore I should have known the extent of the mischief. You may learn accurately the extent of the mischief in this disease. You may learn how much of the lung is solidified, by the extent of a *dead* instead of a *hollow* sound on percussion; and the extent to which there is no respiratory murmur. With regard to the *treatment*, that must be the same whether the blood come from *one* part, or from *another*; and therefore it must be for the sake of the *prognosis* that you employ the ear, and

* "Annals of Medicine and Surgery; or Records of the Occurring Improvements and Discoveries in Medicine and Surgery, &c. Edited by John Elliotson, M.D. F.R.S.; and William Prout, M.D. F.R.S. Vol. I. 8vo. 1817."

make a distinction between the two cases;—the one being a manageable kind of affection, and the other extremely *un*manageable.

On the immediate occurrence of hæmorrhage from the lungs, it is right to treat it as inflammation;—to bleed in the arm freely; and to set the patient upright, and keep him so; in order to make him feel as faint as possible. You should keep him in that position, instead of allowing him to lie down. It is safe to apply ice to the front of the chest; and this, I think, should always be done. There can be no impropriety in it. As soon as you have bled, until ice can be procured, you should throw cold water on the chest; and endeavour to produce a contraction of the end of the vessels;—in the same way as you proceed in the case of the womb. But generally the bleeding soon stops; for a patient seldom dies of hæmoptysis at the time. Bleeding at the arm, throwing open the windows and doors, and taking the clothes off the chest, answer very well. The patient should not be allowed to move. He should be made easy and comfortable; but he should not be allowed to move, or to speak. I have often made persons persevere, for a fortnight together, after dangerous hæmorrhages;—making them write for whatever was wanted. It is proper to starve the patient; to give him nothing but plain water, milk and water, lemonade, or things of that description; and it is surprising how patients, in this disease, bear cold. I know not a single instance of a person suffering inflammation of the chest, from all this exposure; notwithstanding that, in other circumstances, he would, in all probability, have suffered severely.

The best internal medicine, by far, is the superacetate of lead; and this must often be given in considerable quantities, before it will stop the hæmorrhage. Within a month, I have had three cases of hæmoptysis; in which I have been obliged to give as much as three grains every four hours, before I could fully stop the discharge of blood. It is always safe to begin with *one* or *two* grains, every *six* hours; but if the hæmorrhage does not stop, but returns every day, it would be right to give such a quantity as this every *four* hours; and if that does not stop it, you may give *three* grains every *three* or four hours, with perfect safety. In all the three cases, the last mentioned doses were given; and no inconvenience was felt, except from constipation; which was remedied, every day, by some laxative. If you do not attend to the state of the bowels, and procure a motion every day, the patient may become the subject of colic; but if you administer croton oil, or castor oil, or some purgative that contains no sulphuric acid, there will seldom be any colic or pain of the bowels; which is very troublesome. Some persons give opium, to prevent griping; but I have not done so; because I have not found it necessary.

Some persons give the lead in a *liquid*, and some in a *solid* form. I have not exhibited it liquid, because it is very nauseous; and it answers just as well solid. It mixes up with the extract of colocynth into pills, very well; and I have seen the stomach bear it, if given in a pill, much better than in the fluid form. That is the case with all

acrid and nauseous things;—the stomach can bear a pill the best. If the patient's stomach be disposed to reject it, it is useful to give one or two minims of hydrocyanic acid, three or four times a day. If you be giving the lead only three times a day, then you might give hydrocyanic acid three or four times; but if you be giving the lead every four hours, then you cannot give the prussic acid so frequently. You will find the dose required to prevent the vomiting, exceedingly various. In some, it will be prevented by one minim, three or four times a day, taken before the lead; and in other cases, two, three, or four minims, will be required. Of all medicines to prevent others from irritating the stomach, I know of none equal to hydrocyanic acid. Some apply blisters over the chest; and they are very useful in these cases *at last*; but the application of cold, by means of ice, is better. If the means which I have recommended be adopted, you will generally be able to control the affection. Treat it, in the first instance, as an *active* inflammation; and when the hæmorrhage is very considerable, treat it as a *passive* inflammation; or rather combine the two modes of treatment. Do all you can to prevent an excitement of the pulse, by bleeding from time to time, and keeping down the circulation; and at the same time adopt the treatment for passive inflammation, by producing a constriction of the vessels.

ASTHMA.

Before I speak of *organic* diseases of the lungs,—those in which there is a new deposition, or a transformation, or lesions of the substance,—I will consider *functional* diseases of those organs. I will speak first of asthma, and then of hooping-cough. Asthma is often connected with bronchitis and hooping-cough; and very often with inflammatory diseases; but not *necessarily* so. Both asthma and hooping-cough are frequently unconnected with inflammation; nor is there any appearance, after death, that will explain the symptoms. They are frequently specific and functional diseases.

By asthma (from *ασθμαζω*, *to gasp for breath*) is meant a spasmodic difficulty of breathing;—a spasmodic affection of the organs of respiration, below the larynx and trachea. You will recollect that it is frequently united with organic diseases, or with inflammatory states; and that frequently it is merely the result of irritation; so that you may have it without any organic disease, or any inflammation at all. In a case of asthma,—pure, genuine asthma,—you have a violent sense of constriction of the chest, with a loud wheezing respiration;—heard without putting your ear to the chest, or employing a stethoscope. You hear a patient, at some distance, wheezing and breathing for his life. Such an attack as this, is soon accompanied by a short and difficult cough; but as the sense of constriction goes off, the cough becomes freer and deeper; and there is some expectoration.

During this attack, the face is pale, elongated, and pinched; the nose and extremities become cold; the pulse is found to be small and quick; and I have frequently observed it to be irregular. The skin, throughout the body, becomes rough, from the retrocession of blood

from it; horripilatio takes place; and the patient looks as if he were dying. He is cold and pale, and gasping for breath; and in such an agony, from the want of it, that you would think him dying; yet, in the greater number of cases, there is no danger whatever. Such an attack as this, may last only a few minutes; or it may last several hours. It generally takes place in the middle of the night. The gout, when it first attacks an individual, generally does so in the middle of the night;—that is to say, at two or three o'clock in the morning; and this is generally the case, likewise, with asthma. When it first invades, the patient jumps up in bed; throws off the clothes; draws aside his curtains, if he have any; often goes to the window and throws it open also, as he does the door; and stands at the window, to get as much air as he possibly can. After a certain time, he finds that he breathes more easily; can take a deeper inspiration; begins to cough more deeply, and to expectorate; and then he goes to bed again a great deal better. Very often, at the same time the next night, the scene is repeated. When a person is subject to this occurrence very often, the breathing, for the most part, is not quite free in the intervals. It is generally difficult; the patient feels that all is not right; and, at the same time, there is generally a great degree of flatulence. A large quantity of wind is made, undoubtedly, in the stomach. It cannot be generated by any simple chemical process;—that is out of the question; for a person in this condition, just like an hysterical woman, becomes, in a moment, filled with wind; and sends forth torrents, as if there were no end to it; and this occurs without any thing being in the stomach, to promote the production of it. A great quantity of wind is disengaged from the stomach and intestines; but I think there can be no doubt (and John Hunter was of this opinion) that air can be secreted like a liquid; for you see a woman in a moment, from a passion of the mind, swell out and pour forth torrents. It must evidently have been generated at the time; for a chemical process could not have been so instantaneous. This will be the case whether there is any thing in the stomach, or not; and I believe the wind, in these cases, is always inodorous. The gases from the alimentary canal, have been analyzed by the French; and their nature has been ascertained from the contents of the stomach and intestines. An account of this you will find in Majendie's work; but whether the wind just referred to has been analyzed, I do not know. I think it has not. At the same time, there is generated a large quantity of liquid;—patients generate both wind and water. The water is in immense quantities, and quite pale;—containing very little saline or animal matter. They are as pure specimens, both of wind and water, as can be produced (I suppose) from the animal body.

Some persons have these attacks only at certain seasons of the year; and some only in particular places. If they be subject to the affection, they are rendered far more liable to it by eating what is ill-suited to their stomach;—eating articles which they have found will not agree with them. Sometimes indigestion precedes an attack

of this description; sometimes there are symptoms of disturbance of the nervous system;—such as sleeplessness and headache; and sometimes there is a great itching of the skin. These circumstances occasionally precede the disease.

The occurrence of the disease is very various. Some have it only for a few nights; and some for many weeks. It is a disease which attacks all ages. I have seen it, over and over again, in infants at the breast; where, from the very slightest degree of bronchitis,—the slightest catarrh, they have been seized, at different periods of the day, with violent wheezing; and that wheezing has ceased almost as suddenly; and therefore I have no doubt it is asthma. I have seen several instances of it, as I suppose, in boys below puberty and above it; and very frequently it attacks young adults. The recurrence of the disease may last many years. Persons may be subject to it for many years; and then it may cease entirely, without any ill consequences whatever;—without being followed by any other disease. A patient may, at one period of his life, entirely cease to be asthmatic; and this complete cessation of the disease may occur at all ages. With some persons, asthma occurs only in particular seasons, from particular circumstances, and from particular states of the weather; but with some the tendency to it is so strong, that they are sure to have it wherever they are. There are always exciting causes sufficient to produce the disease in them;—so extreme is their liability to it. I have sometimes seen it attended with very great pain. There has appeared to be a violent spasm of the respiratory muscles, so that patients have had violent pain; and yet, without any bleeding,—simply from stimulating remedies,—this pain has ceased.

Although this which I have now described, is the regular form of the disease, yet (like epilepsy) it sometimes puts on very great irregularity. Some persons, in the fit, will make a crowing noise. Some will have a number of deep inspirations successively; and then they will suddenly cease to breathe. There is every sort of variety that you can imagine; but still, no doubt, they are all deserving of the name of asthma.

The disease is literally pure spasm, and does not necessarily depend upon any organic cause. But it may be combined with any inflammatory disease of the chest; and it may be combined with any *organic* disease of the chest. Even the slightest pressure, in some people, will cause this affection. I believe I mentioned formerly, that Mr. Lawrence has described a case, in which violent paroxysms of asthma were induced, simply by an aneurism of the innominata;—causing the least possible degree of pressure upon the trachea. The disease with which asthma is most commonly united, is chronic bronchitis. When persons labour under the latter affection, besides constant difficulty of breathing, they are subject to great aggravations of this difficulty, from time to time;—particularly at night. As in this case they spit up a great deal, the affection is called, by the old writers, *humoral asthma*. But you continually have chronic asthma without chronic bronchitis; just as you may have the latter without any ten-

dency to a spasmodic affection. Sometimes asthma is united with pleuritis and peripneumonia; and on bleeding such patients, you have buffy blood; but in a case of genuine asthma, it is rare for the blood to be buffy. I do not know that it *ever* is so. Asthma is frequently seen united with diseases of the heart; but then it is to be remembered, that nothing is more common, in organic diseases of the heart, than for *chronic bronchitis* to exist. The heart is seldom organically diseased, to any considerable extent, without the bronchia being more or less inflamed.

The disease is easily distinguished from hydrothorax. If you strike all over the chest, you have a clear sound; and if you listen, you have respiration all over the chest;—which you cannot have if any part of the cavity be filled with water. You distinguish it from bronchitis, by the absence of sonorous and sibilous rattle, except in the upper parts. Down below, throughout the rest of the chest, you do not hear those peculiar sounds of bronchitis; or, if you do hear something like them, they suddenly cease; and then there is the sound of health; but while bronchitis lasts, you have sonorous and sibilous rattle; and these only subside either from the interference of art, or the disease itself ceasing. In general, you will hear a loud respiratory murmur all over the chest;—louder than it should be. The absence of other diseases, together with the suddenness of the attack, the suddenness of its cessation, and its extreme aggravation from time to time, will enable you to form your diagnosis.

The prognosis in this disease, so far as the *paroxysm* is concerned, is generally good; but I have seen people die from pure spasmodic asthma. I recollect a young man, who had been asthmatic, being brought to the hospital in a great fright; and, when I saw him, he was dying. He could only breathe while on his knees and elbows. No signs of any other disease were found during life. He was cold and pale, and the pulse was not to be felt; and, in the course of two or three hours, he died. He had been accustomed to asthma; but this fit produced such a severe asthmatic state, that he did not survive. On opening him, no signs of disease were found; but the lungs were all distended;—had lost their contractile power, so as to be unable to collapse; and were as light as a feather. I have read accounts of death from asthma; but it is a rare occurrence indeed. The prognosis, however, must be unfavourable as to the *termination* of the disease. Some persons will be liable to it for life, if they live in particular situations, in spite of all you can do. You have a prognosis to make as to the *paroxysm*, and one as to the *duration* of the disease. The one is favourable, and the other *un*favourable; but then the prognosis respecting the distant event, must depend upon the existence of other diseases. The prognosis, so far as the asthma is concerned, is not bad. People labouring under this affection, often live to a great age; and the disease often ceases of itself. But you must always consider, in these cases, that there may be some other disease; —chronic bronchitis, chronic pneumonia, or disease of the heart; but if not, there may be a tendency to phthisis; and all these things

must be taken into the account, in forming a prognosis. Dr. Heberden mentions a curious case of the cessation of asthma, after it had existed some time; and he also mentions other cases of persons suddenly ceasing to be asthmatic; and never having another attack, though they have lived thirty years afterwards. I have myself known instances of its cessation, after having existed a considerable time. But we can never prognosticate this. If it turn out so, it is all very well; but I think we have no means whatever of *predicting* that it will thus terminate.

The predisposing causes of the disease are not known. Very often it attacks those who are thin and pale; but they have pure, simple, spasmodic asthma. It as frequently, however, attacks those who are short and full,—bulky; and these generally have a combination of asthma and chronic bronchitis. They expectorate a great deal;—have humoral asthma. Of the real predisposition, however, we certainly do not know the nature. We know it is often hereditary. Asthma attacks many, whose parents, one or both, or whose grand parents, have had the disease. It runs in families. With regard to the *exciting* causes of the disease, they are (in general) cold and damp, and especially fogs. Some persons have it only in cold weather; others have it only in damp, foggy, moist weather; but there is a great variety in this respect. Some persons have it only in summer, and are all the better for cold weather; and some never have it but in particular situations. Most people are better in the country, if it be a dry place; but some are better in London; so that persons who have made their fortunes, and retired to the country, have become asthmatic; and have been obliged to return, and live in London again. I have read of cases, where parties have been obliged to go back to an old house in Thames Street. I only mention it, because I recollect a particular street; and that as damp and dirty a street as there is in London. In some persons, this disease is only induced (as it would appear) from particular exhalations from the vegetable kingdom;—the emanations from grass in flower. These are the people who have asthma only in summer; but by far the greater number have the disease aggravated in winter, and are pretty well in summer. Some, however, are never asthmatic till about May or June. I should think all these cases may be resolved into that particular form of disease, which has been called *hay-fever*, or *hay-asthma*. In some cases, there is a simple spasmodic affection of the breath; and in others, there is a violent catarrh, united with the spasmodic affection. This is a disease which has only been noticed of late years; and respecting which I have some curious facts to adduce.

Certain writers have spoken of what they call "a summer cold;" —*catarrhus æstivus*. The first medical composition that I read upon the subject, and the first that I ever knew to exist, was by Dr. Bostock, the celebrated chemist. It was from him I learned that some writers spoke of catarrhus æstivus; but I do not know to whom he alludes. Dr. Bostock states, in the fourteenth volume of the "Medico-Chirurgical Transactions," that at a certain time of the year he

begins to sneeze,—has a "running" of the eyes, and all the other symptoms of catarrh; and that these continue for a certain length of time, wherever he is, and whatever he does. In a second paper, published by him in the same work, he again refers to the subject; and relates his own case at considerable length. Before that time, I had heard people talk about "hay-fever" and "hay-asthma;" but I could not comprehend what they meant. I was told that certain distinguished personages had "hay-fever." It appears to be quite an aristocratical affection;—not at all visiting hay-makers, or those who have to do with hay and straw. I never met with such a thing in practice; and it appeared to me to be a highly gentleman-like, and indeed, (I may add) *noble* affection. I could not tell what to make of it; and I disregarded it entirely;—supposing it to be a sort of aguish or hypochondriacal affection, of which those who had little to do, frequently became the subject. I had no idea that it was an affection of the chest, until I read Dr. Bostock's paper. I happened, however, to be attending in a family, where the mother of the lady was said to have been the victim of it many years. She was a very sensible and superior woman; and she stated that, at a certain time of the year, when the grass came into flower, she was dreadfully distressed in breathing; and was obliged to leave her house, and go to as barren a place as she could find at the sea-side; and there she obtained comparative ease. She told me this had been the case for many years; and that she had tried everything in vain; for nothing did her good. She was not the only member of the family afflicted with it; for an uncle, some of her nephews and nieces, and some of her cousins, laboured under it. It was decidedly an hereditary family matter.

As there are some curious features in these cases, I alluded to them in a clinical lecture delivered at St. Thomas's Hospital. I knew that the course of which that lecture formed a part, was being published; and I thought the shortest way to make the thing known, would be to mention it then. The consequence was, that I received several exceedingly kind letters, from gentlemen unknown to me; giving me facts upon the subject; and as the matter is very interesting, I will read a few of them. One of these letters was received from Mr. Gordon;—a surgeon residing at Welton, near Hull, Yorkshire. He stated that, in the "Medical Gazette," for 1829, he had described the very same thing.* I was not aware of it at the time; or I should have felt it a great pleasure, as well as my duty, to refer to it. He says:—

"I have this evening received Number 186 of the "London Medical Gazette," dated June 25 [1831]. It contains the report of a clinical lecture which you delivered at St. Thomas's Hospital, in March last, on the subject of hay-asthma.

"In consequence of your expressing a wish to receive information on this extraordinary complaint, I have taken the liberty of troubling

* See the "Medical Gazette," Volume viii, Page 411.

you with this letter. I beg leave to state, that I have witnessed several instances of hay-fever, and hay-asthma; and, in the eighty-seventh number of the 'London Medical Gazette,' bearing date August 4, 1829, I published a short account of the nature, symptoms, causes, and treatment, of these curious disorders. In that memoir I have observed, that the best preservative against their attack, is the cold shower-bath. For the last two seasons, however, while employing this, I have administered the sulphate of quinine, with the sulphate of iron:—the former in doses of two or three grains, the latter in doses of one grain, three times a-day. The success which has attended this prophylactic treatment, has exceeded my highest expectations. With two of the most severely afflicted of my patients on whom it has been tried, it has answered so effectually, that both of them have this year been able to walk through a rich meadow, without suffering in the slightest degree; although formerly, if they had ventured out into such a situation, they would have brought upon themselves all the agonies of spasmodic asthma. I hope you will do me the honour to read over the description which I have given of hay-asthma, in the above-named Medical Journal;"—and so on.

"The symptoms I have related, were taken principally from the cases of * * * * * * *. These two gentlemen have been annually attacked with hay-asthma, for the last fifteen or twenty years. They consulted Dr. B., and most of the eminent English physicians, as well as several practitioners on the Continent; but derived no relief from what was prescribed for them. By means, however, of the shower-bath, the quinine, and iron, they have, for the last two years, obtained a complete emancipation from their tormenting disorder."

Another letter is from a practitioner at Bristol, who says,—"I knew nothing about hay-fever, as any definite disease; but your description of it is, with little exception, a very accurate detail of what I have suffered, every June, for several years."—Here was a gentleman who had been ill every summer, for several years, without being aware what his particular complaint was.—"Were I not," he proceeds, "at the present time, annoyed by this troublesome affection, I should probably not have found leisure to give you the trouble of reading any thing on this subject.

"The attack generally begins, with me, at the latter end of May; with great itching of the eye-lids;—particularly at the inner canthi; from which I regularly, during this month, extract some cilia, which grow very near the cornea, and increase the irritation. My most troublesome symptom is sneezing. It is of a violent kind; and often continues eight or ten times. The defluxion from the nostrils is most copious at these periods of the day; while, in the intervals, I have no catarrhal symptoms. Expectoration of clear mucus is also considerable. My sneezing-attacks are sure to come on while I am visiting my patients;—to my great annoyance. This comfortless state generally continues five or six weeks; but is never sufficient to

interrupt any of my employments, or render any confinement *necessary*; though I am always free from it when in the house. How far grass or hay has any thing to do with this affection, I cannot satisfactorily determine. There certainly are several hay-fields within a quarter of a mile of my house. The *air* seems to make me worse; and an open window is my abhorrence, while I am thus indisposed. Last week I spent an hour or two in a friend's hay-field, with a party of ladies; but the syllabub, the ladies, and the pastoral sports, had no amusement for me; and I was glad to get to a corner of the park, where my streaming eyes and nostrils, and noisy sternutations, might escape both remark and commiseration. Certainly, during that afternoon, in the hay-field, was the worst attack I have had; but whether it was the *air* which was cooler than usual, or the *hay*, I could not tell. I must however confess, that my *fancy* on the subject has always leaned more to the effect of some subtle particles, of an irritating nature, than to the ordinary causes of catarrhal affections. My lungs are rather asthmatic;—formerly I had a good deal of asthma. I have never found time to try any remedies; but shall certainly bear in mind yours, should I have this visitation next year."

I have another letter from Dr. Bulman, of Newcastle-upon-Tyne. He has given me several cases; of which the following is one:—

"D. B., aged 36, is of a spare but robust habit, and free from any constitutional or hereditary affection;—except, perhaps, the gout. He has been liable since his seventh year, if not sooner, to annual attacks of the disease so ably described by Dr. Bostock, under the name of 'catarrhus æstivus,' in the fourteenth volume of the 'Medico-Chirurgical Transactions.' The disease invariably commences (about the second or third week in June) with a sense of uneasiness, heat, and itching in the tunica conjunctiva; but the itching is more particularly severe along the tarsus, and in the caruncula lachrymalis. On examination, this membrane is found to be considerably inflamed; but, except in the severer attacks, the inflammation does not extend to the eye-ball. The symptoms before mentioned are attended with watering of the eyes, increased secretion from the meibomian glands, a sense of fulness or rather distention of the eye-ball, intolerance of light, and weight in the forehead. The itching gradually increases in violence, till it becomes almost insufferable;—compelling the patient, notwithstanding every resolution to the contrary, to rub his eyes; by which it is always considerably allayed.

"In the course of a few days, but sooner if the patient has exposed himself to the sun, the inflammation extends to the schneiderian membrane of the nose; and is attended with itching and stuffing of the nostrils, increased secretion of mucus, and violent paroxysms of sneezing; which are also excited by dust of any kind, exposure to the heated external air, effluvium of new-made hay, and the odour of the bean-flower;—perhaps, also, by other odours. As the disease continues to advance, the membrane of the fauces and

lungs is affected;—giving rise to a sense of dryness and extreme itching or pricking in the throat, to slight cough, with tightness of the chest, and difficulty of breathing; but there is little or no expectoration.

"There are several paroxysms daily; commencing with intolerable itching and tingling of the eye-lids, and followed by the most violent fits of sneezing, accompanied by a copious discharge of mucus from the nasal passages. After this the patient obtains a longer or shorter respite; for the paroxysms recur at uncertain intervals; save that one invariably takes place about an hour after rising in the morning. The tightness of the chest and difficulty of breathing, though sufficiently distressing, have seldom been very urgent; but on two occasions they rose to such a height, that the patient conceived himself in danger of instant suffocation. In severe attacks the eye-lids become œdematous. During the whole course of the disease, the patient is languid and listless; and, though restless, is averse to motion. His temper is more irritable than natural; but his pulse is scarcely, if at all, affected. His bowels are regular, and his appetite rather increased than diminished.

"The disease continues till about the end of July, or the beginning of August; when it almost imperceptibly declines; and it is remarkable, that the patient is then able to expose himself to the hottest sun, without the recurrence of any of the above detailed symptoms;"—shewing, of course, that it does not depend upon the temperature;—"and indeed, during the violence of the disease, exposure to the open air early in the morning, and in the evening after sun-set, causes but little inconvenience. The patient has had attacks of this disease in France, Switzerland, and Italy. In the two former countries it was as severe as in England, but not more so; and it is extraordinary, that in Italy, notwithstanding he was daily exposed to the powerful sun of Rome, in the month of June, the disease, though it began earlier, was nevertheless considerably milder, and also of shorter duration, than elsewhere.

"Most of the internal remedies mentioned by Dr. Bostock, have been tried; but in vain. Bathing in salt water, both cold and tepid, has been had recourse to. The former is apparently without effect; the latter has seemed serviceable only so far as it has relieved the tightness of the chest, and the difficulty of breathing. Of *local* remedies, the only one which has proved of any efficacy, is the Unguentum Hydrargyri Nitratis, properly diluted. This, though it occasions considerable pain when applied to the eye-lids, has always greatly allayed the itching and smarting; and has even seemed (probably by being carried into the nostrils with the tears) to diminish the irritability of the schneiderian membrane, and hence to lessen the violence of the sneezing;—a most distressing symptom. The Vinum Opii was tried, many years ago, without any benefit;—as in the case of Dr. Bostock.

"With respect to a residence at the sea-side, it may be observed, that the only instance of the disease attacking the patient previously

to the usual period, was in the last week of May, 1829, during hot weather;—while he was residing, for a few days, in an airy house, situated on a cliff overhanging the German ocean. The attack, however, was slight, and lasted for two days only; but again returned at its usual period in June. As to diet, the patient is decidedly worse when living low.

"The above detail was written some months ago," continues Dr. Bulman; "and I am happy to state, that the patient almost entirely escaped the disease this year;—by merely commencing, some time previously to the expected period of attack, to anoint the eye-lids at bed-time with the ointment; and by bathing them occasionally, during the day, with a collyrium composed of rose-water and acetate of zinc; and after this had dried, smearing them with simple spermaceti ointment, to remove the stiffness left by the collyrium.

"I have only heard of one example of this curious disease, in this neighbourhood. The patient is a gentleman of fortune; and the instant he approaches a hay-field, he is attacked. I have never been able to hear of the disease in the lower walks of life; though my situation, as physician to two extensive charities in this town, has afforded me ample opportunities of meeting with it, did it exist among them. I may add, that none of the patient's family,—that is to say, neither his father, mother, brothers, nor sisters, though originally amounting to thirteen,—were ever affected in the slightest way by this distressing complaint."

There is another case, with which I have been favoured by Mr. Poyser, of Wirksworth:—

"Mrs. H., of middle age, of a full and rather corpulent habit, has been subject for many years to this periodical complaint. The attack generally commences about the middle of June,"—the old time,—"sooner or later; according to the heat or closeness of the weather. A sensation of heat and irritation is first experienced in the eyes and nostrils; accompanied with sneezing, fever, and restlessness. These symptoms (if the complaint increase) are succeeded by a sense of constriction about the chest; aggravated very much by exertion; and increasing, towards night, to a regular asthmatic paroxysm. In the severer attacks of the complaint, there is a permanent wheezing and difficulty of breathing; with an inability of moving, or of remaining in a recumbent position; and accompanied by pain, fever, quick pulse, and a great degree of general indisposition; lasting for some weeks; and leaving great debility, with an œdematous state of the feet, ankles, &c. The treatment has been conducted on general principles."

To shew the hereditary nature of this affection, I will read a little more of Mr. Poyser's letter:—

"Mrs. P. A., also the mother of a large family, has had this complaint several years. The symptoms, in her case, resemble very accurately those described by Dr. Bostock; namely, a sensation of heat and fulness in the eyes, accompanied with redness and discharge of tears. These sensations go on increasing; and a fulness in the

head is experienced, with irritation of the nose and violent sneezing. To the sneezings are added a farther sensation of tightness of the chest, and difficulty of breathing; with a general irritation of the fauces and trachea. These symptoms are worse by paroxysms, and are often traced to changes of the weather and other causes; they do not, however, as in the instance of Mrs. H., go on to regular asthma. The complaint wears itself out toward the middle of July. This lady decidedly considers the cause of her complaint to be an emanation from the flowers of grass. It begins when grass comes into flower. There is a perceptible increase, or paroxysm, when she is exposed to these effluvia; and when the flowering time is over, she can go into a hay-field with impunity; which she could not previously do.

"The father of this lady is immediately seized with violent and continual sneezing, and inflammation of the nose and eyes, when he goes into or approaches a hay-field; but the symptoms go off when he is removed from the smell of the hay. He therefore carefully avoids the exciting cause, and escapes the disease. Three of the sons of Mrs. A. are also subject to this disease; and their symptoms are similar to hers, though less severe. One of these young gentlemen is now at Geneva; and had the complaint there this summer. A younger son (a boy about ten years old) is made asthmatic by the smell of Guinea-pigs."

You see, therefore, what the character of this complaint is;—that it is not merely spasmodic asthma, but excessive irritation of the mucous membrane of the eyes, nose, and the whole of the air-passages. It is a combination of catarrh and asthma.

I have no doubt whatever, that it arises from vegetable matter diffused in the atmosphere; that it is derived from the flowers of some plants; and that, in a great number of instances, it comes from grass. The lady to whom I have referred, and who informed me that she had had the disease so many years, told me that she was once away from home at an inn, where she conceived there was no danger whatever of being affected by the flowers of grass; but she was seized with a violent difficulty of breathing, and great irritation; and on looking out of a window, she found that there had just been brought into the inn-yard a cart-load of hay. She told me also, as another proof that the affection arose from this source, that her children once came into the room after having been playing with hay; and instantly her breath became affected. She also informed me, as a still farther corroboration, that if she handled fresh hay, her hands instantly became affected; shewing the morbid sensibility of her skin to the flowers of grass. Skin, you will remember, is analogous to mucous membrane. I have, however, a letter from this lady, in which she details the whole particulars of her case; and as it contains many interesting facts, I will read it:—"I was first affected with the disease," she observes, "in 1798; and from that period have annually suffered from it more or less. It usually attacks me about the latter end of May, and continues till the

middle of July, and sometimes till the close of that month; but this has occurred when the weather has been unfavourable, and the hay-harvest has been particularly late. I have never suffered after the hay has been got in.

"The first symptoms are irritation of the nose, violent sneezing, and all the usual attendants of a cold in the head. These are succeeded by spasms affecting the breath; which have often been so severe as to threaten my life, and are the most distressing part of the disease. Violent irritation of the eyes, throat, and the whole interior of the head, has been experienced when passing by fields where hay was making; which symptoms have all disappeared very soon after entering a room, and excluding as much as possible the external air.

"I believe the complaint with me to arise principally, if not entirely, from the farina of the grass. It has commenced sooner or later according to the season; and my first symptom has generally occurred when walking in the fields, and not till the grass is *in flower*; and from that time till the hay-harvest, is completely finished, I suffer whenever I am exposed to the air.

"I have tried the sea-air, and also London. The former I found most beneficial; although the latter was productive of considerable relief. Ramsgate and Harwich have suited me the best; which I attribute to the small quantity of grass grown in the neighbourhood; and to the bracing air, which has invigorated my general health. At all places by the sea, I have been immediately sensible when a land-wind blew, and felt instant relief when it came off the sea again; and two years ago, when this was the case at Harwich, during nearly the whole of the six weeks I spent there, I suffered scarcely any inconvenience. I walked out daily; went frequently on the water; and bathed regularly in the sea. During other seasons, I have been obliged to shut myself up entirely in the house; and not to allow a window to be opened, or to permit any one who had been into the air to come near me.

"My children, in approaching me after being in the hay-field, have often brought on a fit of sneezing, or a spasm of my breath; and this was once effected by their sitting down by me to tea, after playing in the barn where the new made hay was stacked, some time after the season was over. Once, at Harwich, when walking on the shore, I became suddenly affected; which occasioned some surprise, as no grass was apparently near; but, on the following day, I found that hay had been making on the top of the cliff, at the time I was walking under it.

"At Cromer, two years since, I was suddenly seized with shortness of breath, &c., after the complaint had subsided, and all the hay in the immediate neighbourhood finished; and upon going into my bed-room, I saw an immense stack making, in a yard near the house, with hay which had been brought there from a field five miles distant. In 1817, I was perfectly well till the grass was cut in our own fields; when my breath became so seriously affected, that it was thought necessary to remove me directly from the infected

air; and I was with difficulty taken from my bed to the carriage which was to convey me to Harwich, twenty miles distant; but when I arrived there, I was so much relieved by the change of atmosphere, that I walked with ease up two pair of stairs to bed; and had no return of illness that season.

"In packing baskets with hay, I have frequently had fits of sneezing, and tingling in my hands; and have every reason to believe that the seeds of the grass are poisonous to me. I have long ceased to have medical advice for the complaint; and by avoiding the exciting cause as much as possible, and using palliatives on the first attack, I have of late years suffered less than formerly. I always confine myself entirely, while the hay is making near me; and at other times I walk with salts, or some other pungent scent, in my hand. When I feel the irritation commencing, if I snuff it up, I can frequently keep off a fit of sneezing. My breath is relieved by sedatives; and smoking stramonium will always check the asthmatic spasms.

"My uncle, Mr. * * * *, of * * * *, and his son, were affected about the same time as myself;—the former with sneezing only, and the latter with all the symptoms. They both attribute it to the grass; and the son is obliged to come to London when his hay is making. A cold season suits me best, and the symptoms are aggravated by a close air; which may perhaps arise from the obnoxious particles hanging in the air, and being thus inhaled in larger quantities.

"The disease has certainly increased rapidly during the last twelve years; and has attacked persons of all ages. Most of those with whom I have conversed on the subject, believe it to be occasioned by the farina of the grass, or something poisonous to them, which floats in the air at that time, and which comes when the grass begins to flower, and departs when the hay harvest is over. I have no disposition to asthma at any other period of the year; and scarcely ever have a cold, or occasion to use a pocket-handkerchief. My habit is relaxed; and I am always benefitted by a cold bracing atmosphere. I have occasionally found my breath considerably relieved by going out of the air, into a crowded assembly; and from our own house in the country, to one in a narrow street in the middle of a town."

It is conceived, by some persons, that it is the sweet-scented grass which is productive of this affection;—at least, many persons have decidedly been affected when they have gone near sweet-scented grass in flower; and some ascribe the greater prevalence of the disease now than formerly, and consequently the notice of its occurrence, to the introduction of some new species of grass into this country.

Seeing that the emanations from the grass (the pollen, in all probability) is a compound, though I do not know its constitution, I fancied that it might be destroyed by the chlorides;—in the same way as some animal matter. I therefore requested a gentleman

who had the disease to try it; and he did so with the most perfect success.

This was the first case that I ever saw of the disease. A gentleman came to consult me upon it, about three years before I saw the lady. I told him, at once, that I knew nothing of the affection; and I sent him away as he came;—so that neither he nor I got anything by the interview. I told him that I had heard of such a thing as hay-fever, existing among distinguished lords and ladies, but I could not conceive what it meant, and therefore I could give him no advice. I casually met him, after I had read Dr. Bostock's paper;—and I requested him, as a favour to myself, to try the effect of a solution of chloride of lime or of soda. I directed him to place it in saucers about the bedroom; to have rags dipped in it and hung upon the backs of chairs; to wash his hands and face with it night and morning; and to carry a small bottle of it with him; and to smell it repeatedly in the course of the day. He complied with my request; and the result was highly satisfactory. The irritation of the ears, (for in his case *they* also were affected), the tingling and the smarting of the eyes and nose all ceased; and by using this precaution, he got through the summer exceedingly well. Whether the chloride acted by destroying the emanations, or by lessening the irritability of the mucous membrane, or of the skin, I do not know. The chlorides, if well diluted, diminish the morbid irritability of the surface; and therefore they might, in this case, have acted in that way. The treatment, however, was perfectly successful. The lady said that she had used every thing, but in vain; and I could not prevail upon her to try the remedy.

In consequence of making this known in the clinical lucture, to which I before referred, it is said by Mr. Poyser, that one of the sons of the lady affected with the disease, employed the chloride of soda. Mr. Poyser says,—"The chloride of soda has been of great use to this gentleman; removing, at once, the sensibility of the nostrils and eyes; and thus allaying the sneezing, cough, and inflamed and watery state of the eyes" But he adds, "Mrs. P. A. has not experienced any perceptible advantage from the chloride." Three out of four, however, did. When persons are also subject to spasmodic asthma, I should recommend them to breathe through water impregnated with the chloride; and a larger quantity ought then to be employed about the bed-rooms, than when they have hay-fever alone.

Some persons are peculiarly affected by other substances. Many persons have a peculiar susceptibility of ipecacuanha;—this is by no means uncommon. If ipecacuanha be powdering in a chemist's house, some persons will be seized with a violent paroxysm on entering it. I have known an instance or two of this description. I heard a physician say that there was a case related on which he could depend,—though I would not myself vouch for its accuracy,—of a person who had such a susceptibility of ipecacuanha, that on entering a room and being seized with asthma, he declared that there was

ipecacuanha about. It was at first denied; but at last some one recollected that there was a box of ipecacuanha-lozenges in a table-drawer. That was going very far; but it is a fact that some persons are seized with asthma, if ipecacuanha be near them. As I shall not have another opportunity of doing it, I may mention here, that other persons are peculiarly susceptible of various things. Some are affected by the emanations of an animal. You will remember that Shakspeare alludes to some females who cannot bear a sucking-pig; and some cannot bear a cat;—they are made miserable if a cat be near them. It does not produce asthma; but the emanation from a cat has such an effect upon them, that they are quite wretched. Mr. Poyser states, that the son of a lady who had hay-asthma, is made asthmatic by the smell of Guinea-pigs. When he is in a room where they are, he is immediately seized with difficulty of breathing. I have a note from a gentleman, in which he informs me that a nobleman with whom he is acquainted, is affected by sneezing and asthmatic affections, by coming in contact with a hare, or rather the *fur* of a hare; and remains ill for several days afterwards. He experiences great suffering, whether the hare be dead or alive.

I have another letter on the subject of hay-asthma,—from Brighton; but I will only read a portion of it. Dr. King says,—"I know a member of parliament, who has come to Brighton every summer for some years, in order to avoid the disease at home. A lady also comes from Clapham, for the same purpose; and with the same good effect. The lady, however, whom I saw with it, told me that she knew a cobbler's wife who had it; and that several persons of the lower orders, to her knowledge, had the disease." Dr. King, in his letter, goes on to say,—"Last year I met, at Lewes, a farmer's wife, subject to the same complaint; and obliged, every hay-season, to take refuge in a town. She bears up against it as long as possible; and shuts herself close up in her room, till a sense of suffocation comes on, as in common asthma; when she is obliged to throw open the window, by which she lets in a fresh dose of poison, and has the same routine to go over again, till she is obliged to fly. As soon as she quits the regions of hay, she experiences immediate relief. I dined lately in company with a lady, who went into convulsions as soon as her plate was put before her, owing to its containing some peas which had been boiled or dressed with mint. We carried her out of the room; and she did not feel quite well all the evening. Her daughter, who sat next her, was not similarly affected."

These are circumstances worth knowing; because, if you were not acquainted with them, you might ascribe cases of this description to whim and fancy. It would be very odd if they were confined to the higher orders only. It is a thing exceedingly improbable. The fact is, the lower orders consider the hay-fever as merely a common cold; and they do not apply for medical advice (being unable to pay for it) unless they are tolerably ill. They do not think of applying to a public charity, because they are seized with a violent

sneezing; or if they do, it is a solitary case, and is treated as asthma;—the nature and causes of the disease not being known.

Laennec has no idea of it; but he mentions one or two curious circumstances. He says that the following fact was communicated to him by one of his colleagues, as affording a curious instance of nervous affection, in a man not subject to asthma. "A man, forty years of age, slightly hypochondriacal, but otherwise in good health, wished to go on horseback to pay a visit some leagues distant from his house. As soon as he left the town where he resided, which is situated in an extensive plain, he felt an immediate oppression on the chest, from the impression of the country air. He took no notice of this at first; but the dyspnœa having greatly increased, and being now attended by a sense of faintness, he determined to return. He had scarcely turned his horse, when he found himself better; and in a few minutes he recovered both his breath and his strength. Not suspecting any relation between this momentary uneasiness and his journey, he once more attempted to advance; and was again soon attacked with the dyspnœa and faintness. On turning towards the town, these passed off. After having made repeated attempts to proceed, and always with the same result, he finally returned; and in just as good health as when he set out. I have lately met," continues Laennec, "with a case very analogous to the one just related; only that in this the symptoms were more severe, and the cause was different. Count H., a man of robust constitution, and although now eighty-two years of age, still possessed of a degree of vigour unusual even at the age of sixty, has been subject from his infancy to attacks of asthma; and is habitually somewhat short-breathed. Since his fiftieth year, he has had a slight cough; and in the morning a pituitous expectoration, intermixed occasionally with some yellow sputa. The asthmatic attacks have always been unfrequent with him; but they have invariably come on if any person has inadvertently shut his bed-room door, or if his night-lamp has by any chance gone out. As soon as either of these accidents occur, he immediately awakes with a feeling of oppressive suffocation; and after a few minutes he becomes insensible. On the occasions alluded to, the attack is got rid of by opening the doors and windows, lighting the candles, and carrying the patient into the open air." I presume it is the smell of the lamp which causes it; and perhaps the emanations from his own body,—the smell of his own perspiration when he is shut up.

You see, therefore, that in many instances of asthma, there is a violent external exciting cause. At least, there is unquestionably an external exciting cause; but it varies much in its power in different individuals. A predisposing cause, in many persons, is bronchitis; and, in others, various organic diseases of the chest. In some persons, without any external excitement at all,—without moisture, or coldness, or confinement from the air,—there will be an asthmatic paroxysm;—simply from an irritable state of the mucous mem-

brane, and from organic disease. I have already alluded to one case where, from the mechanical pressure of a small aneurism, a paroxysm came on,—independently of all external circumstances.

The treatment of this disease may be divided into two parts;—one part relating to the treatment during the fit; and the other to the way of preventing its recurrence. In the fit, if the patient be plethoric, it may be well to bleed; but in general this is not necessary. One of the best things you can do is to give the patient a full dose of opium. Frequently a very large quantity is borne, on account of the exceedingly deranged state of the system. Forty, fifty, or sixty drops of laudanum, are frequently not more than sufficient to relieve the fit. I once had an extraordinary case of this kind; where such a dose was given without any effect. A drachm was then given, but still without any effect; and so also were two drachms. Seeing this to be the case, the medical gentleman who was attending the patient, grew out of patience, and gave half an ounce; which was merely sufficient to get rid of the paroxysm. When the next paroxysm came on, however, that dose failed entirely; and six drachms were given, and produced tolerable relief; but not enough; and at last many drachms were given for a dose, with no more effect than of putting a stop to the paroxysm. These are states of the system, in which ordinary doses are of no use; but, in general, from forty to sixty drops are borne very well; and are sufficient. It is useful to combine the laudanum, in these cases, with a dose of æther; and if you mix them up with ammonia, or with musk, or assafœtida, you will generally add to their good effect. But opium generally answers the purpose. Should the patient be plethoric, however, and have chronic bronchitis and fullness of the chest, it would be very wrong to give a large dose of this description, lest it should produce apoplexy; and it would be right to take away a certain quantity of blood. Some patients are relieved by cupping, and some by *dry*-cupping.

When the paroxysm is over, it would be useful to endeavour to prevent its return, by giving a dose of some preparation of opium, together with æther; but in a smaller quantity than in the former case. Some persons have told me, that they have seen very great relief from cantharides, in this complaint and in hooping-cough; but whether they really are beneficial I cannot tell. The advantage, however, of opium, æther, musk, and assafœtida, is unquestionable. Some have found very great relief from smoking stramonium. I have seen many persons, who have derived benefit from smoking the leaves and stalks of stramonium, chopped up together. Some have found the smoke of *tobacco* serviceable; but far fewer than those who have derived benefit from stramonium. You will find it of very great use to make patients drink strong coffee, without milk and sugar. It is an old remedy, but a very good one. There ought to be no grounds in it, because they may disturb the stomach; and that organ, in this complaint, is generally much disposed to indigestion. If it should so happen that a paroxysm comes on from a

hearty meal, it will be found very serviceable to give a good emetic, either of mustard or sulphate of zinc;—something which will not nauseate the patient long, but will empty the stomach as quickly as possible.

I am supposing, all along, that the patient is free from chronic bronchitis;—has simple pure asthma. If, however, there be any chronic bronchitis present, you will find that squills, digitalis, colchicum, and ipecacuanha, will all be useful;—some by increasing the flow of urine; and others by increasing the secretion from the air-passages. Some have found relief from opium and prussic acid, and others from hyoscyamus and conium; but if you want an immediate effect, I think there is nothing equal to opium and stramonium. There is no rule for these things; for some persons are relieved by *one* article, and some by another. It is right to consider this as a spasmodic disease, which may be removed; and if it can, it should. It may arise from a full stomach; and then an emetic is the best remedy. It may arise from grass; and then the chlorides scattered about the room, I conceive, would be the best thing. But if you cannot remove the exciting cause immediately, or not at all, then you will find that the best mode will be venesection and opium.

With regard to the *prevention* of the disease, besides giving the things just mentioned, and besides removing the patient from the exciting cause if it be known, it is of great use to pay attention to the stomach and bowels. Every body knows, that if the abdomen be distended, the diaphragm cannot descend freely, and we can scarcely breathe; and asthmatic people suffer, in these circumstances, to a very great degree. Dr. Wilson Philip has spoken highly of galvanism in this complaint, and no doubt it does good; but you cannot expect it to be universally efficacious, when you consider that asthma is often united with organic affections, and with chronic bronchitis. When persons are very weak, you find that tonics are necessary,—particularly iron. Dr. Bree used to exhibit the carbonate of iron particularly in the disease;* but I have not found it useful, except as a *tonic*. In regard to the inhalation of chlorine, it may be had recourse to in every form of asthma. You may impregnate water with it, and make the patient breathe through it, and in that way inhale it. If you think proper, you may adopt the same means with regard to prussic acid and conium. Some have found benefit from tar; and others from tanners' liquid, put in one corner of the room. Another way of giving persons the advantage of these things, is to impregnate water with them; and to make patients breathe through the water, three or four times a day.

HOOPING-COUGH.

The next disease of which I will speak, and which is very much allied to the last in some respects, is hooping-cough. The disease is so called, from the peculiar noise attendant upon the cough.

* "Practical Enquiry on Disordered Respiration; distinguishing Convulsive Asthma, its Specific Causes, &c. By Robert Bree, M.D."

Sometimes it is called *chin-cough*, because it particularly attacks children; and "*chin*" (I suppose a corruption for *kind*) is the German for "*child*." In Latin it is called *tussis*,—"cough;" or to shew its intensity, *pertussis*,—"*much* cough."

This disease is easily known when it has been once seen. There are occasional fits of violent coughing, with short expirations,—a volley of them; and then one deep, long, hooping, crowing inspiration; and these are many times repeated. A quantity of viscid phlegm is spit up; and very often the child vomits. The cough is exceedingly severe; every muscle is put into action; the face grows red; the eyes "run;" and then the child, although unable to stand, and apparently about to be strangled, runs about and plays, an instant afterwards, as if nothing were the matter with him. This is very commonly seen; and the cough will come on day after day. At first, there is generally some catarrh and bronchitis with it; and these are of various intensity, as is also the cough. Sometimes the bronchitis is very considerable; so that the child has a constant difficulty of breathing, a constantly quick pulse, and constant heat; and is exceedingly ill. The disease, although to a great degree spasmodic, and sometimes almost entirely so, is occasionally, on the other hand, inflammatory in a high degree. When it has been inflammatory, and the child recovers, the spasmodic cough will frequently continue, even for many months after the inflammatory state has subsided.

The first notice of the disease, is generally occasioned by the extreme violence of the cough, or by a hoop. Very frequently it is not noticed at all, till the child hoops; and then there is no doubt of the nature of the disease. In fact, you are never justified in saying that the disease exists, till the child hoops. If the disease prevails in the neighbourhood, and the child coughs more violently than usual, in all probability, it will "turn" (as people say) to the hooping-cough. But if the disease be not fully formed, one cannot say with certainty that it is the disease, unless the child hoops. If the bronchitis be violent, or if it continue for a great length of time, though not violently, the child may die. As a mere spasmodic affection, hooping-cough does not generally destroy life. In the greater number of cases where children die, there is a violent, or extensive bronchitis, and a violent or extensive inflammation of the substance of the lungs.

On opening children who have died of this disease, you occasionally find very little the matter in the lungs. The child may have died from something else; for the disease has a great tendency to produce hydrocephalus,—to produce convulsions, and various affections of the head;—such affections as we see in children. It is one of the great calamities attending the disease, that the effects of it are so fatal. There is such continued difficulty of breathing, and such violent cough, that the vessels of the head are over-distended; and the consequence is such congestion and irritation of the head, that hydrocephalus continually occurs. I know that violent coughing

will overstrain the vessels of the head, and produce great mischief; for I saw, not long ago, an infant that had never been well from the moment it had coughed violently. It was so strained, that the parents from time to time, fancied it would die. From the instant of the coughing, the head drooped, and convulsions came on; of which it ultimately died; although, till it was seized with this violent cough, it was comparatively well,—having nothing the matter with the head; and having only a common cough at first;—such as other children in the family had. Thus you see children dying from hooping-cough, or from the *effects* of it rather than from the disease itself; and yet, after death, you can discover very little wrong in the lungs. But frequently, indeed *generally*, on examining the lungs, you find a large quantity of mucus in the bronchia. You find the mucous membrane red, thick, soft, and pulpy, and increased in thickness; so that there is clearly bronchitis. You also frequently find the lungs very solid. The air-cells have become inflamed; and the lungs are very much hepatized. I have opened children who have died from hooping-cough; and nearly the whole of the lungs have been like liver. They did not collapse; and on pressing them, you could scarcely diminish their bulk in the least. When these circumstances take place, on listening to the chest you hear the common signs of bronchitis;—you hear the silvery rattle which occurs in the breathing of adults; and you hear the respiratory murmur excessively loud and rough throughout the chest.

The disease may destroy a child in two or three weeks, or it may not destroy it for many weeks; but after the disease has lasted six or eight weeks, it generally gives way. It seldom continues longer. Children, however, from the very slightest cold, are apt to hoop again. Some will hoop occasionally during the greater part of a twelvemonth; and some, when they have once had the disease, if they catch a severe cold, at a more distant period even than that, will be observed to hoop. It affects by far the most frequently *children*; but it also affects *adults*. I heard that the late Archbishop of Canterbury had it, a short time before he died. It is frequently an epidemic disease. It does not, in general, occur more than once; except in a mere spasmodic form;—when the parts are thrown into such a condition as to produce hooping, although the real disease does not return.

Hooping-cough is supposed, by some, to depend on a specific contagion. Some deny this; but others assert it. I was always taught that this was its source, and I never thought of doubting it; but others have done so, and I suppose they have a reason for it. Any irritation whatever will provoke a paroxysm, when a patient has the disease. If a child be put in a passion, or you move it about quickly, or give it any thing stimulating, then a paroxysm will take place. There may be various exciting causes of a *paroxysm*; although the peculiar exciting cause of the *disease*, I presume, is only one;—either a specific contagion, or something peculiar.

When a child vomits, it is generally considered a good sign. If

there be no vomiting with the cough, it is observed by those who have most experience, that the child gets worse. Dr. Gregory knew a lady, who never hooped in the disease; and therefore it was hardly "*hooping*-cough;" but she always fainted. The disease prevailed in the family, and she had as violent a cough as the rest; but at the time she ought to have *hooped*, she *fainted*.

The danger is in proportion to the other symptoms;—that is to say, the symptoms of affection of the head, and of bronchitis and peripneumonia. The younger the child the greater the danger. It is a very dangerous disease when it occurs in infants. Those who suppose that the disease arises from contagion, consider that it remains latent, from a few days to a few weeks; and they suppose that the disease itself, when it occurs in an individual, is not capable of communicating contagion beyond a month or six weeks;—just as is the case with other contagious diseases. Gonorrhœa, for example, after a certain lapse of time, although nobody will venture to fix the period, is not contagious.

The treatment of hooping-cough is two-fold;—accordingly as it respects the *inflammatory* or the *spasmodic* condition of the parts. The most important thing, by far, is to remedy the inflammatory state;—the bronchitis or peripneumonia. If it be found that there is a constant oppression of the breathing, with spasmodic attacks of increased difficulty, and occasionally a violent cough, and that there is an accelerated pulse, and pyrexia; together with sonorous, sibilous, and crepitous rattle,—it will be evident that there is inflammation of the bronchia, or the substance of the lungs;—the air-tubes, or the air-cells, or both. Of course that inflammation must be remedied in the usual way. You might give all the anti-spasmodics, all the narcotics, and all the other medicines that are supposed to have a direct influence over the spasm, and yet do no good. In fact, you would make the patient worse; and if nature were not to get the better of you, and cure the individual, there is every probability that great mischief would be done. It is therefore highly important to ascertain the existence of inflammation; and to remedy it, if possible, in the usual way;—by taking blood from the neighbourhood of the chest; occasionally by bleeding in the arm, if the patient be old enough; but particularly by *local* bleeding, and the exhibition of mercury, and of emetics. In the greater number of cases, the inflammation is such as will yield to the application of a few leeches, and the exhibition of emetics; but it is of great use, at the same time, to clear out the bowels by calomel, provided the inflammation is severe, and to give it steadily in small and repeated doses. The inflammation is frequently not so severe, but that an emetic every day, or night and morning, will be found sufficient for all the purposes of remedying the bronchitis; still I would not trust to it in severe cases. In this, as in most diseases of children, the warm-bath is of essential service. It is thought by some, that the friction of tartar-emetic ointment over the chest, is more useful than the application

of blisters. I rather feel disposed to think that is the case; and that blisters are not of very great utility in the affection.

You will find it of very great importance, not to allow children to overload the stomach; for the cough is generally much more troublesome after meals than before. When there is any inflammation, the food should, of course, be exceedingly light;—affording scarcely any nourishment; and the patient should not be allowed to distend the stomach with liquids. During the whole period of the disease, even when the inflammation is gone, you will find it of use to let the food which is given be very compendious;—not to be bulky. It is also of great use, in this disease, to prevent children from moving about a great deal; for running will frequently excite the cough; and it is also of great use to keep the child quiet mentally; for a fit of passion will bring on a violent cough. The bronchitis will sometimes continue for a great length of time. The breathing will be difficult for some weeks; there will be more or less feverishness; and the child will waste away; but by the steady employment of antiphlogistic regimen, with a moderately open state of the bowels, many cases will do exceedingly well;—notwithstanding the bronchitis may continue, though not in a violent degree, for some time.

Next to the employment of emetics, you will find narcotics of very considerable use. Emetics will not cure the disease; because there is, in many cases, violent inflammation, and you must treat that in the usual way; but there is hardly a case of hooping-cough, that will not be much mitigated by the continued use of emetics. In the first instance, a large number of cases may be trusted to them, and to the administration of narcotics. Prussic acid is very useful in this complaint; not in subduing inflammation, but in subduing the tendency to cough. You may give it to the youngest child; but of course it should be in a small quantity. If the child be young, you may put one minim to one or two ounces of almond-emulsion; and one tea spoonful of this mixture will sometimes be found as much as is proper. This is one of the most convenient modes of exhibiting it; and from the sixteenth to the fourth of a minim may be given, three or four times a day. After the disease has lasted some time, you will find opium more or less useful, given in a small quantity. "Dover's powder" is one of the best forms. The extract of conium and hyoscyamus may be given in small doses, rubbed up in mixtures or emulsions; but I think prussic acid is one of the best things. It will not cure the disease; it has no specific power over it, any more than any other narcotic; but it does remedy spasmodic irritation of the air passages, exceedingly well; and very often better than other narcotics. After a certain time has elapsed, and no bronchitis exists, or so slight a degree of it that it requires no inflammatory treatment,—when there is debility and irritation of the air-passages, rather than any thing else, tonics may be given. Various *metalic* tonics have frequently been employed. I do not know that any one is so good as iron; it seems to me to be the best we have. The

sulphate is a form in which the medicine may be given very conveniently to children, dissolved in various mixtures; and as they are fond of sweet things, the carbonate,* mixed with treacle, may be very easily given them. I am not aware that it exerts a particular power over the cough; but, when the disease has existed some time, you will find such remedies very useful.

Some persons place a great reliance upon friction, with some external application; and narcotics are frequently applied in this way. I believe that a very good remedy is a quack medicine, called "Roche's Embrocation." Any stimulant not sufficient to abrade the cuticle, and produce inflammation, if it have united with it a quantity of opium, will be found exceedingly serviceable. Friction along the spine is particularly recommended. After a time, there can be no doubt of the use of the cold shower-bath; but one of the best things is change of air. Every old woman says so; and I believe she is perfectly right. I have known (as every one must) many cases, where the cough continued in spite of all the medicines that could be given, and all the physicians that could prescribe them, till the residence was changed; and then the cough speedily diminished. This will not do good at the beginning. It is only when the disease has existed some time, and is disposed to cease, that you find a change of air will cause it to disappear, better than any thing else. The inhalation of tar-fumes has been recommended; but as these are acrid, it would be a wrong practice during the inflammatory stage; though when the disease becomes merely spasmodic, they may be of use. The mode of employing the tar, is to put it in a pipkin in the room, and to let the fumes ascend so as to impregnate the air. In doing this, great care should be taken that the fumes are not too strong; or they will *cause* irritation, instead of *subduing* it; but, with proper precautions, it is a remedy that is of great use. I dare say chlorine, used about the room in the same way, would be beneficial; but great care is required not to use these things to the degree of producing irritation.

Hooping-cough is a very troublesome disease to treat. You may save life by subduing inflammation; but with regard to removing the complaint, you may find yourself very much baffled. Much good, however, may be done, with respect to the spasmodic part of the affection, by good management;—by giving light food, and a very moderate exhibition of narcotics. Of all these prussic acid is the best; for although its exhibition is not very satisfactory, I am persuaded it is *more* satisfactory than that of any other narcotic.

SPASMODIC COUGH.

There is a cough which you every now and then see; and which is not the "*hooping*-cough;" but what may be termed "*spasmodic* cough." This affection is, perhaps, united with a degree of inflammation; or perhaps not; but if it be united with inflammation, it is out of all proportion to it. I believe this is what is meant by "spasmodic

* The *Sesquioxide*.

cough." I have seen a few instances of a most violent cough, tearing persons in pieces, like hooping-cough; but still it was *not* hooping-cough; and it occurred in adults.

In this disease, I know that iron is by far the best remedy. I have cured every case which I have seen of it, by the exhibition of the carbonate of iron. In many of these cases there is no indication for bleeding; although, if the patient be robust, it may be expedient to bleed in the first instance; but I have always treated such cases with the carbonate of iron, and with great success. In every case where the cough is out of proportion to the inflammation, or where there is an organic disease (even consumption), you will find iron to be the best remedy. Many cases attended by cough and expectoration, which have been mistaken for phthisis, have given way to this remedy.

NERVOUS COUGH.

I have now and then seen a very extraordinary cough in young women. All very extraordinary cases, independent of organic disease, are to be seen in young women. Cases are continually seen in young women, of so extraordinary a nature, that you would not believe in their accuracy, if you merely read them in books. I recollect very well seeing a young lady, single,—for these cases almost all occur in single ladies,—who complained, that every time she inspired she coughed, night and day. She breathed slowly; but when the time came for expiration, she coughed. Nothing was expectorated; and on listening to the chest, there was nothing preternatural to be heard. She had coughed in that way for months. At first the cough was quiet when she slept; but when I saw her, it would not allow her to sleep. I did her no good, and what became of her I did not hear. It was the most extraordinary case I ever saw. I have no doubt it was a nervous cough;—that it did not depend upon any inflammatory or organic disease; and that it would cease entirely of itself, in the most sudden manner. Occasionally females will have a *barking* cough. Sometimes they will have a violent spasmodic cough, such as I have now described, only modified in various ways; so that they will make all sorts of strange noises (such as shrieking);—unattended by organic disease, and apparently arising from a mere nervous derangement of the parts. The exact nature of these affections, I have not been able to ascertain.

PHTHISIS PULMONALIS.

The first *organic* disease of the lungs I shall mention, is one in which unfortunately we can do little or no good; and which causes more destruction in this country, than any other affection whatever. It is "consumption." I shall commence by describing, not the symptoms, but the changes of structure which take place in the lung itself.

This disease is called, in *common* language, *consumption*, or *pulmonary consumption*; and in *medical* language, *phthisis pulmonalis*,

or simply *phthisis*;—"*pulmonalis*" being understood. The word "*phthisis*" is derived from φθιω, *to consume*. This disease is apparently of a scrofulous nature. The substance which is deposited is precisely that which takes place in parts, when we say they labour under scrofula. Some have made varieties in phthisis, as being tubercular or not; but by "*phthisis*" is now meant, not an *ulceration* of the lung, but a *scrofulous disease* of the lung; which *may* produce ulceration; and which *will* produce ulceration, if it continue long enough. But ulceration not connected with this disease, is not called "consumption." An abscess may be formed from common inflammation, rare as it is; but that is not called "phthisis;"—it would be called simply an abscess in the lungs, or a *vomica*. By "*phthisis*" is meant a deposition of a scrofulous substance in the lung; and all the organic changes to which its presence, or the state which produces its presence, gives rise.

The deposition, in this disease, takes place in minute granules; which are greyish, semi-transparent, and pretty firm; lying close to each other, over a certain space in the substance of the lungs. Although at first they lie distinct from each other, yet they are close. They increase in size; and they likewise increase in number; and as they increase in this twofold manner, they of course approximate. The space between them diminishes; till they coalesce, and form a mass. When they increase in size and number, they possess less semi-transparency;—they become opaque and yellow, This change is first observed either at the centre, or on some part of the surface; and from the point at which it commences it gradually pervades the whole "tubercle," as it is called. When they are so few that they increase considerably, each tubercle seldom exceeds the size of an almond; but the masses produced by their aggregation may be very large. I have often seen the whole of one lobe of the lung, and I once saw the whole of one lung, converted into a solid tubercular mass. It is right to mention, however, that Laennec conceives that the tubercular deposition in such a case as this,—where the whole lung, or the whole of a lobe has become a tubercular mass,—has taken place in a diffused manner; that there has been a formation of distinct separate tubercles; but that the substance was diffused in the texture of the lung; and he calls this mode of deposition *tubercular infiltration*. Whether he is right or not, I do not pretend to say.

The shape of the tubercles is round, and rather oval; and this might incline us to suspect, that their situation is the air-cells. That they may be formed within the air-passages, is proved by the dissection of glandered horses, by Dupuytren and Andral. The bronchial tubes were filled with granules, mixed with pus and tubercular substance. Hence it is clear that these substances may be found in the air-passages; and Andral says, that he also found a tubercular mass in the minute twigs of the bronchia, where no ulceration existed; of course, therefore, the deposit may be formed in the air-cells. Many have said that this deposition takes place in the cel-

lular membrane of the lungs; but when we consider its situation, and consider that it is found in the minute bronchial twigs, and not leading to ulceration, it is probable that it is formed in the air-cells. Cruveilhier says that, after injecting mercury into the bronchia of a living animal, he found each globule of the metal surrounded by a concrete substance, formed of white granules, in various parts of the lungs. By injecting the mercury into the bronchia, it reached the air-cells; and he afterwards found granules, formed of tubercular substance, around the globules of mercury. Still it is to be remembered that a similar effect is produced in the cellular membrane, by injecting mercury into an artery; and that flakes, precisely similar to those in the lungs, are seen in the spleen, and in the cellular membrane of various parts. I will not, therefore, take upon myself to pronounce, whether tubercles exist in the one or the other. They may exist in both; but there are arguments on both sides.

After a longer or shorter time, the tubercular mass softens,—generally first in the centre; and the greater part becomes a fluid, resembling pus, in the midst of which are seen particles of the original solid and friable deposit. The membrane which is often found around the deposition, likewise secretes pus. Long after the tubercle is gone, the membrane which surrounds it continues to secrete pus; and the cavity enlarges by ulceration. The openings of the bronchia, which had been lost by the deposit surrounding them, blocking them up, compressing them, and causing them to ulcerate, —are seen opening into the cavity of the abscess, on all sides. Bands of pulmonary substance, and blood-vessels (shrunk and obliterated), are seen leading across the cavity, with tubercular deposit upon them; while a great number of blood-vessels are completely obliterated, and run flattened along the sides.

While some tubercles are advanced to this degree in one part, you will find others less advanced; and others, again, exceedingly minute (having been recently formed); both at a distance, and in the neighbourhood. You will see them in all states, in the same lung; but it is an established fact that, in by far the majority of instances, the greatest deviations from a healthy structure, exist at the superior part of the lungs; and the first tubercles are in the greater number of instances, deposited there. The reason why there is the greatest devastation at the upper part of the lung, is because the tubercles are first deposited there. In proportion to the duration of the tubercle, in general, is the change it has undergone; and if tubercles, therefore, be deposited in the upper part first, you will expect the third stage to be arrived at there, sooner than at the other parts. The reason of the tubercles being first deposited in the superior part, is not known; unless it be that the superior part of the chest is more exposed to the vicissitudes of temperature, than other parts. It certainly is a fact, with respect both to males and females, that the upper part of the lungs is less covered by dress than the lower. In ladies, and in women of all kinds, the neck is bare; and so is the upper part of the chest; and with regard to our-

selves, we have the breast more open than the lower parts; except when close square waistcoats are worn. But whether this will explain the circumstance I have mentioned, I will not pretend to say.

Some have made observations upon which lung is most affected with tubercles. Laennec says the *right*; but the majority of authors say the *left*. I have never made any observations on the matter; but as Laennec says the right, and the majority of authors say the left, I suppose that one side is as much subject to them as the other. The intervening portions of the lung, dividing the tubercular deposition, are frequently turgid with blood, and with a bloody serous fluid; and sometimes they are indurated, and of either a red, or a grey colour. The substance between the tubercles, is by no means always healthy; but is generally in the condition I have now stated. The bronchial membrane, if you slit it up, is frequently found red; and evidently smeared with a far greater quantity of mucus than in health. Thus there is evidently peripneumonia,—inflammation of the substance of the lungs, in many cases; and likewise bronchitis. There can be no doubt at all, I think, that by far the greater quantity of expectoration in phthisis, is derived from the bronchial membrane. A much larger quantity is furnished by it, I am convinced, than by the abscess; and the fluid secreted by the bronchial membrane is, as in common bronchitis, of all degrees of consistency, and of all degrees of quality.

Admirably as the morbid anatomy of phthisis has been investigated by the French, I am bound to do justice, on this subject, to one of our own countrymen; as I formerly did on the subject of enlargement of the air-cells, to Sir John Floyer, and Dr. Baillie,—a truly eminent physician of the last generation. In the "Medical Communications," you will find a very admirable paper on the Morbid Anatomy of Phthisis, by Dr. Stark; who was a very clever young man, and fell a victim to his ardour in investigating Morbid Anatomy. Dr. Stark, nearly fifty years ago, pointed out that phthisis was essentially a tubercular affection;—a fact which, though known to Hippocrates, had been passed over by almost every other ancient writer,—Greek, Roman, and Arabian; and by many of the moderns. Sydenham himself considered tubercles and abscess, as rather the *effect* of disease, than the actual disease itself. Boerhaave was not aware of the subject. Dr. Stark established that this was a tubercular disease; and, in his paper, traced the tubercles from their original minuteness and solidity, to their enlarged and softened state. He asserted that the chief seat of the affection, was the superior and posterior part of the lungs; and particularly, he says, the *left* lung;—agreeing therefore with a great number of writers, in opposition to Laennec. He stated that the bronchial ramifications were never obstructed or obliterated; but opened into the cavity;—just as I have shewn you in the drawings; but that the blood-vessels suddenly became constricted near the orifice; and even obstructed by a coagulum; so that an injection would not pass into the abscess from the large blood-vessels, or flow into the blood-

vessels around the abscess. He found that the injection rendered the parts quite hard; so that parts which appeared firm before, became soft by contrast. He also mentioned, that the parts unaffected by the tubercles, but immediately around them, are generally red and firm; so that he found, between the effects of the tubercles and this induration, that about one quarter only of the lungs, in extreme cases of phthisis, remained fit for duty. He ascertained that the tubercles generally have a capsule; and that adhesions of the costal and pulmonary pleura, generally exist where an abscess is within. You will find, when you open persons who have died of phthisis, and when the tubercles exist near the surface,—especially if they be softened down,—that there are adhesions on the outside of the surface of the lung, attaching it to the pleura. This is a provision of nature, to prevent the escape of the contents of the abscess into the cavity of the membrane. The care taken by nature to prevent sudden and speedy death, which would take place, were the blood-vessels not filled up by a coagulum, and flattened down upon the sides; and the equal care taken to prevent sudden death from inflammation of the pleura, occasioned by the escape of pus from any of these abscesses,—is certainly very striking; but both circumstances were pointed out long ago by Dr. Stark. The French are not aware of his existence; having, till of late, read so little of English literature.

The symptoms of phthisis vary, of course, according to the progression of these tubercles. This is the case both with the general symptoms, and with those which are to be learned by the ear. When the tubercles are only in a solid state, and are not united together into groups, we can learn nothing of their existence from the ear. We can only *presume* their existence, from the general state of the patient; and therefore cannot be *sure* that tubercles are formed. When they are sufficiently numerous to constitute groups, then, by striking that part of the chest, we hear a different sound from that which is audible, when nothing but air is present. You must also suppose, that when the part is softened again, and a cavity is produced, various other sounds will be heard. The part will sound different from what it would, were there no cavity at all, and no unnatural state of the parts; but where the air enters a healthy part, and leaves it again. From what I have said respecting the morbid anatomy, you will see clearly the reason for the different symptoms I shall have to detail. You will perceive that there must be more or less pain, cough, expectoration, and at last hectic; and you will see that the sounds in the chest must all perfectly correspond.

Having thus gone over the chief points of the morbid anatomy of phthisis, I shall now proceed to consider the general symptoms. This is for the most part a very slow and insidious affection. Long before any other symptom occurs, it is very common for the individual to be seized with hæmoptysis,—spitting of blood. This, as I mentioned when speaking of hæmoptysis (or hæmoptoe, as it is sometimes called), is usually from the bronchial membrane. The

blood is of course frothy, scarlet, and mixed with air. Occasionally it is in considerable quantities; but, for the most part, it is not to any great amount. The patient frequently has several returns of this, before any other particular symptom of phthisis presents itself. When phthisis occurs, there is then, for the most part, little or no more spitting of blood. Whether this has occurred previously or not, one of the first symptoms noticed is a short tickling cough;—such a cough as the patient denies even to exist. It is observed by his friends, while he himself for the most part complains little of it; or, if questioned on the subject, denies it altogether. The cough is short, tickling, and hacking, rather than very severe. With this cough there is generally spit up only a little mucus;—either at the same time, or soon after its commencement. It is very common to hear the patient complain of "a stitch in the side," generally low down; and one would think it was a little pleuritic affection; only that sometimes the stitch is undeniably felt beyond the chest in the parietes of the abdomen. I have known a very violent stitch, before any other symptoms of phthisis, low down in the abdominal muscles, out of the way of the chest; so that these pains, though they are occasionally pleuritic, are, I have no doubt, very frequently muscular. The cough is generally worse when the patient gets into bed; owing, I presume, to the coldness of the sheets; or when he rises in the morning;—from the coldness of the atmosphere of the room, compared with the warmth of the bed. There is felt a little shortness of breath on motion;—on any exertion, the patient finds that his breath is not so good as before; and he complains of languor. The flesh becomes soft; so that on taking hold of the arm of a patient, even at this time, you find it is flabby. The hair loses its strength; so that it cannot be kept in order as before. You observe this particularly in females. There appears to be a softness of the hair; which will not allow it to remain in the way in which it has been placed. There is also observed, about this time, a little feverishness. The pulse is found to be quicker than natural; and this comes on particularly after the least exertion. An exertion which before would quicken the pulse only perhaps ten beats, will now quicken it twenty or thirty, in a minute. On falling asleep, it is very common for patients to find that they sweat in some one part of the body;—in the calves of the legs, for instance, or upon the chest. The power of resisting external temperature is diminished; so that the patient complains of chilliness. The expectoration, although only mucus originally, is now streaked with a little blood. Perhaps the patient never had hæmoptysis, but the complaint has begun with the general symptoms I have mentioned, and the expectoration was mucus; but he tells you, on one of your visits, that what he has spit up was brown, or tinged with blood. That is another form, in which a discharge of blood takes place. Very frequently there is the hæmorrhage which I before mentioned; but more frequently, perhaps, there is no such thing as any decided

hæmoptysis; but the mucus, after a time, becomes a little streaked with blood.

There is now more cough, more dyspnœa, and more debility than before; and the patient begins to find that he lies more easily on one side than on the other. The patient finds his strength decrease; or, if he do not himself allow it, yet it is evident to others. He cannot make the same exertion as before; and it is also pretty evident that he loses flesh. Occasionally there is a sharp pain in the side, of a pleuritic character, so as to make it necessary to take away a little blood. There is clearly inflammation of the pleura. If the patient be a female, menstruation is almost sure to decline. The catamenial discharge loses its natural redness; becomes paler than it should be; and, as well as being thus impaired in its quality, becomes more scanty in its quantity; and, more frequently than not, ceases altogether. You will generally observe that, as these symptoms all proceed, the ends of the fingers become enlarged. The last joints of the fingers look broader than they did before. You will find that the whole appear tumid; and that the nail is particularly prominent. The eyes, too, become very clear. You observe a whiteness and transparency of them, which you did not see before;—the sclerotica looks of a more intense white than natural. The nails sometimes become very considerably incurvated. The whole nail is more convex than before; and, I believe, rather softer,—like the hair; and that part of the nail which is unattached to the cutis, is in many instances very much bent. The weakness of the hair is now such that, whether the patient be male or female, it falls off. The hair, which at first is only soft, and with difficulty kept in order, now generally becomes scanty. The expectoration, from being mere frothy mucus, now becomes a little green, or a little yellow, and more abundant; and instead of being long and stringy, like the expectoration of health, it becomes short between the fingers. Now and then the expectoration becomes fœtid, the strength very much declines, the sweating at night becomes very profuse, and the expectoration decidedly sinks in water; whereas before, either the whole of it, or the greater part, swam. Shreds are seen in it, whiter than the rest; like curdy lumps, or fragments; and, in some few instances, you observe earthy matter in it. The latter is, by no means, so frequent an occurrence as the former; but you see it now and then. The tongue will sometimes remain in a healthy condition; but in most instances it becomes loaded with mucus, and is foul and yellow, on the one hand; or becomes red at the edges and tip, on the other. Sometimes it is of an intense redness all over; so that it looks like a piece of beef.

There is now an increase in the pulse at two periods, at least, in the day;—that is, in the middle of the day and in the evening; but decidedly in the evening. There is a great exacerbation of it, together with heat of the body, after every meal. The pink sediment of hectic appears in the urine; and the pulse is constantly much quicker than it

should be; perhaps seldom below ninety, and frequently above a hundred. The mind and the appetite remain unimpaired. Persons labouring under this disease, will frequently eat heartily to the very last;—have a perfectly good digestion; and their mind is as alive and active as it ever was;—perhaps more so. Patients generally have hope. They will not believe they are in a dangerous state;—they do not think that their case is consumption. On the other hand, when people are not active, and think they are labouring under phthisis, in nine cases out of ten there is no danger whatever. A remarkable feature in the disease is this hope; even medical men, who have fallen victims to phthisis, have insisted, up to the day of their death, that they had not ulceration of the lungs; and that they should get well. This has been observed in intelligent men, as well as in those who were most stupid. It is not a matter of judgment, but of feeling; and hope in this disease, is exceedingly remarkable, quite characteristic of it, though it is by no means an *invariable* circumstance. Now and then you will see persons despond. They are quite aware of their situation, in this disease, when it is well established and confirmed; but in a much greater number of instances, there is the most lively hope. Patients will not believe that there is any danger.

In the greater number of cases, the intestines suffer very much. Perhaps, at the beginning, the intestines are a little dormant; but as the disease proceeds, and especially at the last, the intestines fall into a state of diarrhœa; and the purging very frequently alternates with the sweating. The purging is so severe, that you may say it melts down the patient; and it is called "*colliquative* purging;" and the sweating is so profuse, that it is called "*colliquative* sweating." The expectoration becomes more yellow and green than before; and it also becomes more abundant. The cough becomes more severe; the legs become œdematous; and the body wastes exceedingly. The hectic flush is seen, decidedly, upon the cheeks and palms of the hands; and the exhaustion is such, in some cases, that the patient frequently faints. He feels exceedingly languid. The patient is, at last, confined to his bed in all cases; but, in some instances, there is great tendency to syncope, and dyspnœa from debility; so that stimulants are required. Just before death, the brain is sometimes affected; so that there is frequently delirium, three or four days before death.

The progress of all these symptoms, is exceedingly various. Sometimes only a few weeks, but in other cases many years elapse, before the patient sinks under the affection. I am convinced that I have seen cases, where there were no symptoms of phthisis; and yet the patient has died from ulceration of the lungs, in the course of three months. I recollect one instance of this particularly. On account of some anomalous symptoms in the abdomen, the patient was continually examined by me. He was two or three miles from London; and on carefully examining his chest, I found that he was free from cough, and from all the symptoms of phthisis generally; as well as

from those symptoms which can only be learned from auscultation. He then began to expectorate; showed signs of phthisis; and died. On the autopsy we found ulceration. All this occurred in the course of two months. The public at large are aware of this state; and they give to such cases as these, the epithet "*galloping consumption.*" On the other hand, the disease will last, there can be no doubt, for very many years; that is to say, persons will have cough, and expectorate; yet it will not increase, but decline from time to time; and so they will go on, till at last they expectorate a great deal, and die in the usual way. Dr. Gregory, of Edinburgh, used to say that he knew a case, where a person was in a state of consumption, for fifty years; but it is impossible to say that the patient laboured under *phthisis* all the time; it might have been only *bronchitis.* But it is a fact, that there is very great variety as to the duration of the disease. It is generally quickest in those who have the finest skins, and are nearest the period of puberty; or who are not very much beyond that period. The disease is frequently suspended, on the other hand, by pregnancy, and by suckling; and now and then it has been suspended by other diseases, as by ague or insanity. These, however, are only occasional circumstances.

You will now be prepared to understand the symptoms which take place during the progress of this disease, and which are acquirable by the ear. At the first period of phthisis, there is nothing at all to be learned from the ear; at least, I believe not. It is from the general appearance of the patient, and from the general symptoms of which he complains, that you suspect that phthisis is present. At the onset, it is at most only a matter of *suspicion.* You cannot be *certain* of it. You will easily see that this must be the case, when you consider that, in the first instance, the tubercles which constitute this disease, are exceedingly small and exceedingly few;—leaving a large portion of pulmonary structure perfectly healthy. It is only when the tubercles increase to a certain size, and approximate, so as to form a mass, that you can expect any symptoms discernible by the ear. It is only when a considerable portion of the pulmonary structure is beset with tubercular deposit, that you can expect to discover any audible change. The parts in which the symptoms acquirable by the ear are to be noticed, in the first instance, are below the clavicles. This may be observed before the tubercles have softened; but when they become sufficiently large, and sufficiently numerous to occupy some space, on striking over the part where such deposit exists, you will not find the hollow sound of health, but a greater degree of dulness than there was before. In proportion to the size of the tubercular deposit, is the dulness of the sound; and you may save yourself a great deal of trouble, by beginning your examination at the clavicle, and immediately under it. Still, if you have any suspicion, and yet you find the parts below the clavicle sound well, you should examine other parts; because now and then the deposition, instead of taking place there, occurs in other situations. In the great majority of cases,

however,—I may say in nine cases out of ten,—the change takes place just below the superior portion of the lungs; and therefore you should commence your examinations there. Besides this dull sound on percussion, if you listen with the stethoscope, and make the patient speak, you will find the voice resound there in an unnatural manner. The solid substance of the tubercles, is so much better a medium of conveying sound, than the loose structure of the healthy lung, that the sound is louder where these tubercles exist than elsewhere. The voice will not come through the tube, as if the patient's mouth were at the other end of it, speaking to you; but you hear the sound echo; and you hear it louder than natural. You have no pectoriloquy; but you have what is called *bronchophony;*—the same sound that you hear in putting the stethoscope over the large bronchia. But it is to be remembered, that the voice naturally sounds louder under the clavicle than elsewhere, on account of the large tubes being there; and therefore you should not depend on this symptom alone. It should be united with the dead sound on percussion, in order to satisfy you that there is bronchophony dependent upon tubercular deposition. It is well to compare the sound on each side; for the deposition generally takes place more on one side than on the other; and frequently it occurs *only* on one side; and your suspicion will be increased, as to the really unnatural loudness of the voice, if you hear it louder on one side than on the other. You will be much more satisfied of the real existence of this disease, by comparing the sound of both sides, than if you merely attend to one. The difference of the two is frequently very manifest.

But when the tubercular mass softens, and a portion is discharged, so that the cavity is emptied, or nearly so, you have a new symptom. The bronchial tubes, you know, enter this cavity; and as the air enters it, you have the same state of parts there that there is in the trachea;—that is to say, there is a large space, into which, on inspiration, the air enters; and consequently, when the patient speaks, you will have the same sound that occurs on putting the stethoscope over the trachea. If you place the stethoscope over the trachea, you have the voice traversing the tube, as though the mouth were at the other end; and just the same occurrence takes place, when you put the stethoscope over a cavity in the lungs;—you have the phenomenon called *pectoriloquy.* If you make the patient cough, you hear a mucous rattle;—the same sound as if air were forced through soapsuds. It is a gurgling sound, arising from air agitating a viscid fluid. But as the contents grow less and less viscid,—as the curdy matter of the scrofula is more and more spit up, and mere mucus forms, more and more, the contents of the cavity, the gurgling is heard louder, and is found to be freer. Then, if you make the patient breathe quickly, and at the same time rather deeply, you hear the same sound that you do if you make him breathe quickly, and put the stethoscope over the trachea. In the latter case, you have the sound of the air evidently going through a large space;

and the same circumstance occurs in the former instance;—merely arising from the part being of the same description as the trachea. You have the same phenomena with respect to simple respiration, the same phenomena with respect to the voice when the patient speaks, and the same phenomena when you make him cough, that you have when you place the stethoscope over the trachea;—that is to say, you have pectoriloquy. You may, however, have the same symptom of pectoriloquy in the most perfect health, if you listen over a certain part of the chest;—especially in thin persons. If you place the stethoscope between the clavicles of a person who is thin, you have pectoriloquy; because the large bronchia going to the lungs, emit the sound of a tube, even if the individual be healthy. You must not, therefore, pronounce a person in a state of phthisis, simply because you have pectoriloquy between the clavicles; but when you hear it decidedly in other parts of the chest, then there can be no doubt as to the nature of the case.

When things have come to this pass, you no longer have the dull sound on percussion, that you had in the first instance. The tubercular solid mass, which gave the dull sound on percussion, no longer exists; and consequently there can no longer be the phenomenon which it produced. That phenomenon was a dull sound, from the part being solid. The part is now hollow; and on striking over it, you find the sound as hollow as in health; and perhaps *more* hollow. It is to be remembered, that though you have pectoriloquy, and you thus have a large space which ought not to be there; yet the phenomenon does not shew the nature of the cavity; and it is only from the general symptoms, that you are satisfied it is the cavity of phthisis. You will recollect that I mentioned, when speaking of gangrene of the lungs, that a part of the lung is sometimes separated, —discharged; and that a cavity will exist, from that circumstance; so that you may have pectoriloquy from gangrene of the lung. But then you know that it arises from gangrene by other circumstances; —such as the great debility of the patient, and the fœtor of the expectoration. You may, from chronic bronchitis, have the bronchial tubes very much enlarged at one spot;—as large as the bronchia themselves, or approaching to their size; and in that case you will have pectoriloquy; but then there will not be present the general symptoms of phthisis, and thus you will suspect the nature of the case. You see that no reliance is to be placed on the ear alone; and that the symptoms which are *audible*, are only to be taken in conjunction with those which are *general*. Persons find fault with auscultation unjustly, who suppose it is employed to the exclusion of attending to other symptoms. No person who uses his ear, is justified in making so absurd an application of it. The person who is disposed to employ his ear, ought to be careful in adopting all the means of making observations within his power. A person may be labouring under ulceration of the lungs; and yet he may not afford the sign of pectoriloquy. If the cavity be near the surface of the chest, and the walls of the cavity be very thin, and if the bronchial

tubes that open into the cavity, have mouths so small as to bear no proportion to the cavity itself, you may have a large cavity, and yet no pectoriloquy at all. Here, again, is an instance of the fallacy of the observations made by the ear alone, to the exclusion of the other symptoms. Like every body else who has attended to these matters, I have over and over again opened patients, and found a large cavity after death; where, before the fatal termination of the case, there had been no pectoriloquy at the affected spot. The walls of the cavity must be a certain thickness, for the phenomenon of pectoriloquy to be produced; and the bronchial tubes opening into the cavity, must bear a certain proportion to it; for when the cavity is near the surface of the lung, and the substance of the lung has been entirely destroyed, so that there is merely pleura forming the parietes of the cavity, you will cease to have pectoriloquy. If, however, you had seen the patient before the cavity became so large, as to be out of proportion to the bronchial tubes opening into it, and the walls became so much diminished, then you would have had pectoriloquy. But you may not have been called in before the patient arrived at this state; and therefore may not have had an opportunity of observing the successive changes.

When an excavation is very large indeed, you will sometimes have another phenomenon;—you will have what is called *metallic tinkling*. By this is meant a sort of silvery, ringing, metallic sound, when the patient coughs, speaks, or breathes; but particularly when he coughs;—a clear metallic ringing, which can hardly deceive you. But the sound is not peculiar to this affection; for when the surface of the lung is ulcerated, and air escapes into the pleura, that being a very large cavity, it just gives you the same phenomenon. When air enters into the pleura, you have metallic tinkling, from the presence of the air and fluid together; but if it so happen that there is a large cavity in the lung, that will come to the same thing; and the air and fluid entering into it, will give rise to the same sound. The cavity, however, is seldom so very large as to produce it.

You seldom examine a patient at that point, when much information is to be derived from the ear. In the first stage of the disease, there is nothing to be learned from it; and as the disease proceeds the case is generally perfectly clear, without the use of the ear; but if a set of symptoms do present themselves to the ear, they are as worthy of being observed as those that present themselves to the eye; and the mere trouble of examining them, can be no excuse for not observing them. Unfortunately, in the great number of instances, the case is too severe to render such examination necessary; but cases do occur where the disease is not so severe; and some will say that the affection is *bronchitis*, while others assert that it is *phthisis*. Persons are said every day, by those who do not use the ear, to be in a state of phthisis, when they are not; and *vice versa*. Now if the ear be used after a certain time, and we ascertain the existence of a cavity; this, in conjunction with the other symptoms, will render the case clear. The examination must not be too late; or

the phenomenon of pectoriloquy may have ceased. It is of great importance to be able to say that there is pectoriloquy; for a practitioner may have said that it is not phthisis at all, and he will stick to it; but if you listen, and hear pectoriloquy, you may be sure that he is wrong; and may be able to convince him of it. It is a fact that some practitioners who have taken a predilection for other organs,—particularly the liver, or the viscera of the abdomen,—may declare that there is no such thing as phthisis present; while it is evident enough that the patient's lungs are rotten. Now if, in a case like that, you can induce a person to listen to you, and can shew him the difference between the sounds in health, and those in this disease, you may open his eyes; or you may bring forward such an argument as cannot be resisted. It would be unphilosophical not to know these things; and not to attend to them if they do exist.

When you find such a state of things as this, the prognosis must always be unfavourable. If only one part of a lung be beset by tubercular deposition, it is possible that the substance may soften, be expectorated, the part heal, and the patient do very well. It is possible that you may have pectoriloquy,—that you may have signs of confirmed phthisis; and that yet the patient *may* recover. Such things, however, are exceedingly rare. I doubt whether it is a very common thing for these excavations to heal at all; but it is a far more uncommon thing for the patient to get well; because, in general, the disease is constitutional; and if one excavation should heal, a crop of tubercles occurs in some other part, and goes through successive changes; and under these the patient will sink. When you open a patient who has died of phthisis, you almost always find tubercles in various stages; and if you could heal one lung entirely (as it has been proposed to do, by making an opening into the chest, and causing the lung to collapse) I doubt whether you would do much good; because the other lung is generally beset with tubercles, which will regularly go through their stages in the same way. But I do doubt very much, whether these cavities heal so frequently as has been supposed. I am quite sure, on account of the succession of tubercles, that persons rarely recover; and I doubt whether the cavities heal, so often as Laennec thought they did.

Laennec says, that he has frequently seen a cicatrix in the lungs;—that a cavity had existed and healed; that the sides had come together; and that the part become solidified and hardened;—just as is the case with a cicatrix on the surface of the body. The appearance spoken of by Laennec, as indicative of a healed cavity, is a depression, or puckering, on the surface of the lung;—just as in a cicatrix on the surface of the body, when there has been an abscess below. If there be merely superficial ulceration, you know that a scar is left; but in proportion to the depth of the ulceration on the surface of the body, and in the parts immediately below the surface, so is the depth of the cicatrix and of the puckering. This appearance is sometimes seen on the surface of the lung; and Laennec says that, on cutting down on such a part; you find below it induration, to a

greater or less depth. My reason for doubting this is, that you see exactly the same appearances upon the liver. Almost every month, if you open many bodies, you find a puckering on the surface of the liver;—a depression, with a puckering all around it; and, on cutting into it, you find the substance of the liver unnatural as to colour. But there is no ulceration; in fact, there *could* have been no ulceration,—no suppuration; for there are no signs of there having been any matter. The peritoneal surface of the liver will fall into a state of chronic induration; here and there it will become indurated and hard, and it is commonly puckered; and there you have the appearance of so many scars. Now the same thing, I know, will take place in the lungs. You may see them puckered, and you may see the pleura very hard there; but I cannot see that that is any reason for believing that there is a cicatrix. And you may be deceived from finding a large track of some depth down the lungs, (which should not have deceived Laennec), from a mere cohesion of the different lobes of the lung. It is common, when there has been a slow thickening of the pleura,—to say nothing of inflammation,—to find the lobes glued together, and the pleura between the lobes thick, and almost cartilaginous. Sometimes there is a puckering on the surface; and, on cutting down, you find a cartilaginous hardness to some depth; and, on careful examination, you find a cohesion of the different lobes. Independently of that, the pleura will fall into the same sort of disease as the peritoneum over the liver; and will produce just the same appearances. On reading Andral, I find that he has come to the same conclusion as myself; and I have no doubt that others have done so likewise. It is said that, now and then, a cicatrix may be produced; but I am sure it is a rare occurrence.

But sometimes people, without any cicatrix, get rid of this tubercular deposit. When it has occurred only at one spot, an open cavity remains; and so the patients go on, and live for a long time. This, however, I believe, is comparatively rare; it is so common for tubercle after tubercle to take place in the lungs, and go through successive changes, that people generally do not live. It certainly does happen, sometimes, that the lining membranes of these cavities become hard, secrete a quantity of mucus, and so remain during the rest of life. No further mischief is done; pectoriloquy is always heard; and the patient is only troubled with cough and expectoration. But this, also, is comparatively rare.

Now and then,—but this likewise is an uncommon occurrence,—death will take place from ulceration extending outwards through the pleura. In cases of this description, the patient is generally seized with a sudden difficulty of breathing. On striking the chest, you find that there is a very clear sound; and (as you may suppose from the air escaping from the lungs to the pleura) the lungs become more and more collapsed. If it occur on the left side of the chest, the force of the air will be such, as to drive the heart to the right side. This is called "*pneumo*-thorax;" but, as I shall after-

wards point out, it should be termed "*pneumato*-thorax." I shall speak of this when I come to diseases of the pleura; but it is to be remembered that, now and then, ulceration is not confined to the lung itself; but that the pleura becomes ulcerated, or is rendered so thin, that it gives way; and then you have air and fluid in the pleura. I shall speak of that more particularly hereafter; but I must now mention it as one of the effects of consumption. In general, nature prevents this,—however near to the surface the cavity may be,—by causing adhesions. You will recollect I mentioned generally, that when a tubercle is near the surface of the lung, the pulmonary and costal pleuræ, one or both, throw out lymph, and become glued together; so that ulceration may go on within, and yet neither air nor fluid can escape into the pleura. But now and then nature fails. A tubercle exists near the surface; the ulceration goes on; no adhesions take place; a perforation is produced by the ulcer; and the phenomenon of air and fluid in the pleura occurs.

Besides those morbid appearances, and those symptoms which I have mentioned as occurring in phthisis, you will find a variety of others in different patients. Some have very great disturbance of the digestive organs; some have tenderness of the epigastrium, tenderness of the abdomen where the small intestines lie, and tenderness likewise of the liver. Some have very little appetite; but a large number have an *excellent* appetite; and digest and eat well, to the last moment of their existence. It is very common for a fistula to form by the side of the rectum; and it is very common to find, after death, a considerable inflammation of the mucous membrane of the intestines. It is by no means uncommon to find the intestines ulcerated; to find a scrofulous deposit in the mesenteric glands; and to find the liver more or less diseased. The French have attended, very minutely, to the proportionate occurrence of these different morbid affections of other parts. I believe you will find in the work of M. Louis (a physician now living in Paris), the most accurate information on this point.* It is very common to find the trachea ulcerated;—to have a scrofulous deposit in various parts of the trachea; particularly about the larynx. In some instances you have soreness, violent cough, and every other mark of chronic disease of the larynx; whereas, in other cases, there is no hoarseness, or other sign of affection of the larynx or trachea; except a little inflammatory irritation, indicated by an excessive secretion of mucus.

I do not know that it is worth while to state these things particularly. In phthisis, you will very often find an inflammatory state of various parts of the abdomen. You will very often find fistulæ; and often organic disease of the liver, and oftener still of the intes-

* "Recherches Anatomico-Pathologiques sur la Phthisie. Par P. C. A. Louis, M.D." This, our most able monograph on Phthisis, has found a translator every way qualified to do it justice, in Dr. Cowan, of Bath. I confess the great pleasure I have in referring to the labours of Dr. Cowan; for some of my pleasantest recollections are linked with the time which we spent together at Edinburgh. At that period, my friend gave the brightest promise of future excellence;—a promise which time is rapidly ripening into mature performance.

tines. Now and then, scrofulous tubercles are found in the brain, or at least under the pia mater; but, for the most part, the head remains perfectly free.

There can be no question, that the disposition to this disease is frequently constitutional,—frequently hereditary. Those who are most subject to it, are usually fair persons; with light hair, a sanguineous temperament, soft skin and hair, and long pointed fingers. Their flesh is flabby,—not firm; and the pupils of their eyes are large. They are frequently thin and tall; but whether they are tall or not, persons of this description are slender, with a long neck. Frequently, too, such persons have been subject to hæmorrhage from the nose when young. There is another description of persons subject to phthisis; comprehending those who are not tall, but short; and who have not light hair and a fair skin, but are rather swarthy, and have dark hair and dark eyes. These also have large pupils; and their skin is rather soft; and instead of having *long*, they have *short* fingers and nails. Like the others they are of a lax fibre;—their muscles being flabby; and persons of this latter description, generally have a tumid upper lip. There are, therefore, two descriptions of persons most liable to phthisis. Both, in general, have a soft skin, soft hair, a flabby fibre, and a pale look; but those of one set, if they be not tall, are slender; and generally have light hair and a florid complexion; and are disposed to hæmorrhage; whereas the others are short, with dark hair, a tumid upper lip, and short truncated fingers. This form of body is of course constitutional; and it likewise may be hereditary; so that the disposition to phthisis may be said to be, in many persons, constitutional and hereditary.

A certain age is more liable to the disease than any other. In this country, scrofula is more likely to occur, in the lungs, between the age of eighteen and thirty, than at any other period. When it occurs later than this, it is perhaps more frequently the result of unfavourable external circumstances, acting upon constitutions moderately disposed to it, than of the mere intensity of the predisposition.

There can be no question that it is greatly predisposed to by bad food, bad lodging, and bad clothing. Many would escape the disease, were it not for their being exposed to wet and cold, being badly protected in the way of lodging or of clothing, and not fortified with the means of resisting wet and cold, by good food. The latter keeps up a good fire within; and compensates, in a great measure, for the unfavourable state of the atmosphere. Hence the disease is much more frequent in countries which are wet and cold, than in others; and it is more frequent in countries which have cold and wet alternating with warmth, than in those which are simply cold. For example,—I believe it is not so common in Russia, as in many other warmer parts. Alternations of temperature, especially cold and moisture united, alternating with a warm temperature, seem to have the greatest effect in exciting the disease; and to be the great pre-

disposing cause,—next to hereditary, constitutional disposition, or the want of food, clothing, and lodging. It is far less frequent in *tropical*, than in *temperate* climates. Indeed, it is said that real strumous phthisis is unknown in the tropics, or is confined to the European settlers; who bring the disposition to it from unfavourable climates. It is a disease seen, more or less, in all parts of the world, or nearly so; either occurring among the inhabitants, or among those who come from countries where it is very common. Some ascribe the comparative rarity of the disease (I only say "*comparative* rarity") in Russia, to the circumstance of the people having good clothing,—being clad with furs and other warm materials, and eating plenty of animal food. All the inhabitants of cold climates, eat a large quantity of animal food; while those who inhabit warmer regions, care little about it, and live principally on vegetables. The diets of Italy and Russia are completely different. To show the effect of clothing upon the disease, it is said that it was unknown in Scotland, before the people changed their dress from woollen to cotton. I suppose that is an exaggeration. Formerly, it is alleged, that, in Scotland, the people were all dressed in woollen, as the Romans were; but that since they have changed it for cotton, the disease has become very prevalent. The disease is said to be the least prevalent among butchers, fishermen, and fishwomen;—the women who sell fish; and who, in Scotland, are called "fishwives." The cause is said to be, that these people eat plentifully of animal food.

When the predisposition is very strong, the most favourable external circumstances can scarcely keep away the disease. You will see a family, brought up with every care in guarding against cold, having good food, good clothing, and good lodging, and attention paid to the slightest indisposition, and yet, one after another,—especially if they be females,—they become the victims of this disease. On the other hand, where the disposition is not so strong, by taking great care to avoid vicissitudes of temperature, to dress very warmly, and to be well nourished, people escape it. And if persons intermarry who have this disease in their respective families, who themselves are disposed to it, and perhaps afterwards die of it, one or both, the affection is almost sure to be transmitted to the offspring. You must have all seen instances of the death of children, whose mother died some years before of the same disease. Where two first cousins marry together, the predisposition derived from this unfortunate mixture becomes so powerful, that a very phthisical offspring is generally the result. Whoever belongs to a phthisical family, should endeavour to "cross the breed," by marrying some one that is not phthisical; because, although it is delightful to marry a lady delicately beautiful to all appearance,—having white teeth, a fine skin, soft hair, and so on,—yet misery is sure to be the consequence. The disease is almost sure to begin; and the offspring perish one after another.

The immediate exciting cause of the disease, when one is apparent,

is generally that of any common inflammation, any common cause of catarrh. Exposure to cold, more particularly cold and wet, especially when applied partially, and again, especially when the body is overheated, is the most common exciting cause. Persons with a strong predisposition, catch cold from the slightest causes;—from something that would be insufficient to give another individual cold; and what would be mere *catarrh* in one person, becomes in the other the commencement of *phthisis*. Sometimes tubercles have already existed in the lungs; and these merely produce inflammation in the organ. In other cases, inflammation is induced in the air-tubes; and the disposition being strong, the debilitating effects of the inflammation, lead to the production of the tubercles.

Whatever exhausts the body may produce this disease. When persons are predisposed to it, they will have it come on without catching cold at all; but simply from over-exertion of the body, or over-exertion of the mind. But where there is mental exertion, there is almost always anxiety. It is seldom that a person is occupied mentally without anxiety; and therefore anxiety may, in a great degree, be the cause of the disease. There can be no doubt that the depressing passions will produce the disease. I have seen a case myself, where, in a predisposed family, an individual has become the victim of phthisis, decidedly from the very time that some great source of grief occurred to him. Powdery substances in the atmosphere have excited the disease;—not simply in cases where there was a strong predisposition to it,—but where the powdery dry substance is of a hard nature, (such as portions of metal, or of stone), the disease is produced almost without any predisposition being discovered. There are certain occupations, in which fine particles of stone are diffused through the atmosphere; and others in which fine particles of *steel* are so diffused; and the persons exposed to these, very frequently die of phthisis; so that, in some parts of the country, where these trades prevail, few men, who work at them, live beyond forty; and many die much before that time.

It has been supposed that the disease will arise from contagion; but it is in foreign countries that this idea prevails. It is believed in Languedoc, Spain, and Portugal; and the clothes of patients who have died of this complaint, are there burned by the civil authorities. Morgagni was so frightened at the contagiousness of this disease, that he never opened the body of a person who died of it; but that was evidently the result of a little nervousness, rather than of his better judgment. It is mentioned as being contagious by Morton,—a writer on this disease in our own country; but it was not so considered either by Hippocrates or Celsus. I do not believe that it is in the slightest degree contagious. Like others practising medicine, I have seen hundreds and hundreds of cases of the disease; but I never saw an instance, in which there was a shadow of probability for the doctrine of contagion. I have seen husbands nurse their wives, and wives their husbands; and I am quite sure that where the survivor has become phthisical, the proportion has not been greater

than you might expect, where a disease is so prevalent as phthisis. It is not uncommon for persons, in the same family, to fall into it where there is great anxiety. I hardly recollect a case where the husband has died of phthisis, and the wife has fallen a victim to it immediately afterwards, where there has not been a predisposition to it. I have seen so many hundreds of examples of the reverse, that I do not think the proportion is greater than it would be, if it were a matter of absolute certainty that the disease is not contagious at all.

The presence of other diseases will excite this. It is very common for phthisis to come on after inflammation of the lungs, and after severe bronchitis, peripneumonia, or pleuritis; but it is certainly very often the case, that the inflammatory disease which has preceded it, has been the result of a general predisposition to disease in the region of the chest. Sedentary occupations, of all descriptions, must be unfavourable in this disease; because, in sedentary occupations, there is a want of fresh air, as well as of due exercise. In such occupations too, there are generally many persons collected together; and unhealthiness, of all descriptions, must be engendered. With some, the exciting cause has been great respiratory exertion;—such as excessive public speaking, excessive reading aloud, excessive blowing of wind-instruments; and some have had symptoms of phthisis, which have declined after giving up the flute, or some other wind-instrument. The disease has frequently been excited by mercury. It is very common for us to see persons who have been in the foul wards of an hospital, and undergone a considerable administration of mercury, fall into a state of phthisis. Excess in venery is likewise, by no means, an unfrequent exciting cause. I have seen many young men die of phthisis, a twelvemonth after their marriage; although they have shewn no signs of it before. You will sometimes have an abscess of the lungs;—you will sometimes have an abscess of the *liver*, making its way, and producing an adhesion to the diaphragm, and of the diaphragm to the lungs, and so on; but all this is not *phthisis*. Where, however, there is a great predisposition to the disease, this may be the exciting cause.

With regard to the *diagnosis* of the disease, it must be made out by general observations respecting the patient;—general observation as to predisposition, and as to constitution. Then, again, as to the *progress* of the disease, if a person has had, for a great length of time, cough, which has generally increased;—if there has been a falling away in flesh; and the individual has not passed the middle period of life, but is between eighteen and thirty;—if these symptoms occur, and there has been phthisis in the family, you have still greater reason to suspect the formation of tubercles. If, in females, there be a suppression of the menses;—if, in males or females, the ends of the fingers become enlarged, and there are frequent attacks of hæmoptysis, together with a continual cough,—the case will be rendered still more suspicious. By means of the stethoscope you may ascertain, after a time, whether there is a cavity or not; but the diagnosis of this disease is but too easy, after the affection has once formed.

As to the *prognosis* it must always be bad. It must be a very happy circumstance when a person recovers from tubercles in the lungs; but you ought never to calculate upon it. It is a great blessing when it does take place; but you should never expect it.

The *treatment* of the disease must be totally different in different circumstances. Very little can be done, in general, after it has gone on to a certain length. We can then do something to alleviate suffering, it is true; but before it has occurred, unless the predisposition be very strong, I think that much may be done in preventing it;—provided the person be in a situation to enable him to do what you wish. The great mode of preventing phthisis, when there is a predisposition to it, is by invigorating the body as much as possible; —by taking care that the individual shall have plenty of fresh air; shall go out every day; have just exercise enough, without producing fatigue; have a good portion of rest at night, and never be deprived of it; eat plenty of animal food of the best quality; and take malt-liquor, or a certain portion of wine, if it can be borne. Malt-liquor is the most invigorating; while, for the most part, wine merely stimulates, and in most cases does harm. The state of the mind is also of very great importance; and the utmost care should be taken to commit no excess in study, exercise, venery, or anything else; so as to do nothing that can do harm, and yet maintain all the functions of the body. The utmost attention should be paid to clothing. A large number of females, in this country, fall into consumption chiefly through their own fault. The poorer classes cannot dress well,—cannot be expected to take that care of themselves which they ought; because they have not the means; but the rich, and the middle classes, do everything they can to fall into consumption. They do not wear sufficient petticoats. They wear silk stockings, and the thinnest shoes, and so walk out; or if they do not walk out thus attired, they stand on the steps of the door, and often go some yards on the pavement, before they get to their carriage. They will go from the hottest rooms without anything about their feet. They take little sleep; have party after party every night; and then, at last, fall into a state of consumption. Neither themselves nor their friends will believe, that this want of rest, and this extreme excitement have been the cause of it; but I am quite sure they have. I think I have saved the lives of several young ladies, by insisting on their following my advice of wearing plenty of flannel;—flannel-drawers, flannel-waistcoats, and high dresses, so as to come up to their collar-bones. I have seen several who appeared to have every disposition to phthisis; but who, by wearing flannel next the skin, from their collar-bones to below the knees, have passed that age at which phthisis, in all probability, would have begun; and they have ultimately done well. I have taken care to add to this good living; —making them take meat at least once a-day. Many wish to make themselves look slender and genteel; and therefore they starve themselves, as well as dress in thin clothing. You should make them eat meat once or twice a-day; and take an allowance of malt-liquor.

If you can do all this, you may in many cases prevent phthisis; especially if, in addition, you can make patients use the cold shower-bath. Many cannot bear a cold shower-bath, at first; but they can bear a shower-bath *tepid*; and by degrees they can bear it *cold*. It was only a few days ago, that I saw a young gentleman, whose brother died of phthisis. He expectorated blood at the same time as his brother; and they appeared equally disposed to phthisis. In one, the disease ran on very fast; and he died. The survivor was spitting blood continually; and the pupil of his eye was large. I prevailed upon him to begin the use of the shower-bath; and he has done so all the winter. The result is, that he has lost his cough, spits no more blood, and is now a strong young man. No doubt, if he take care of himself, and commit no excess of any description, he will go on well. I do not know any means so powerful in hardening the body, as the use of the cold shower-bath; but it is to be remembered, with respect to hardening, that you cannot harden *every* person, and that you may kill many in the attempt. Some ladies, in order to strengthen themselves, will go out of doors in the most frosty weather; and by that means often injure themselves. You may make the most delicate hot-house plant hardy, by lowering the temperature gradually; but what will *harden* one, will *kill* another; and what will not harden one at all, would be quite sufficient to harden another; and therefore the greatest care should be employed. Some try to harden themselves by having the window open; and they glory in having snow on their coverlet. Some can bear it; but a great number never could bear anything of the kind. Still, I am sure, it is proper treatment to harden people as much as can be borne.

You find, however, that some persons are so disposed to an inflammatory state, that it is not at all admissible to give them wine, beer, and meat. They may be of so inflammatory a disposition, that the utmost you can do is to clothe them well, make them guard against catching cold, and order the shower-bath. Some persons are so disposed to hæmorrhage,—hæmorrhage from the nose, and then hæmorrhage from the lungs,—that nothing stimulating can be allowed. There are such cases; but I know that, in the greater number of instances, by fortifying the constitution well, and adjusting the means used to fortify it, to the state of the constitution, you may do great good.

When the predisposition is very strong, it is not only necessary that the patient should most carefully avoid catching cold, by wearing warm clothing when he is out of doors, and by avoiding all danger arising from wet feet, but the temperature of his room should be prevented from falling too low. In many cases it is necessary that the bed should be warmed; but others, not so delicate as that, should have a fire in the room, either when they go to bed, or when they get up,—once in the twenty-four hours,—for the purpose of thoroughly warming it. Some persons are so delicate,—so disposed to phthisis, that we can hardly allow them even to go out during the winter; and a certain degree of artificial temperature must be main-

tained in their rooms; but these are cases where the predisposition is extreme, and the debility very great.

It is also of great use where there is a strong predisposition, to send patients to a warmer climate than our own,—to a thoroughly warm climate. One of the best places to which they can be sent is the West or East Indies. If that be too far, one of the best places is the south of Spain, or the south of France. Many parts to which people are sent, are very objectionable. Lisbon, for example, is very cold in the winter; and both Venice and Naples have high mountains in the neighbourhood; and therefore are not good. If you cannot send patients to the East or West Indies, the south of Spain and the south of France are certainly among the most proper places. But many cannot go even there; and for them the warmer parts of England are the only situations left. I need not mention, that parts of Cornwall and Devonshire are the most suitable; and I believe Penzance is particularly so. Nearer to London, one of the best places is Hastings. Many persons have an idea that if, instead of living in London, they go to Brompton, they are more protected from the disease; but I do not know whether there is any thing in that opinion. I have heard practitioners found fault with, for allowing their patients to live in London, and not sending them to Brompton. The latter has a great name; but I do not know whether it deserves it. But all this must be done before the disease is fully formed; for when it is once established, I think it the greatest cruelty imaginable to send patients abroad. It is horrible to see the grief it occasions; and the patient dies of consumption after all. To send them away from home, and suffer all the misery of the journey, is not only very absurd, but very cruel. It is much better, when the disease is once formed, to allow patients to remain at their own home, where there is every comfort around them.

When the disease has formed itself, the treatment must be very different in different circumstances. You generally have to subdue or mitigate inflammation. There are frequent attacks of pleuritis, bronchitis, and peripneumonia. You commonly find the pleuræ, or the lungs (including the air-cells and bronchia), or both, in a state of inflammation. Persons are continually seized with violent stitches in the side; and it is necessary to take away a little blood;—four or six ounces, sometimes more; or to cup the part, or to blister it. You find the blood buffed; and you have to treat the case, for a time, as one of inflammation of the chest, but conjoined with little power of the constitution. In these circumstances, of course it is necessary that the diet should be low. If patients be seized with hæmorrhage, it is often necessary to treat them in the same way. It is generally necessary to bleed the patient to some little extent; and to keep him on low diet. When there have been attacks of inflammation or of hæmorrhage, it is necessary, for some days, to pursue antiphlogistic diet; but these may all subside, and you may have recourse to nutritious diet again, or now for the first time, if you have not resorted to it before. It is right, however, not to take alarm at

every pain which a phthisical patient may have in the side; for many such attacks will go away, without any strong antiphlogistic measures; and many will go away from the application of a blister, or of a mustard-poultice, which is one of the best things. If, however, that will not remove it, it is requisite to bleed; and to treat it in the common antiphlogistic manner.

Supposing, however, that there is no inflammation or hæmorrhage to subdue; and that the patient is free from pain, and has been so for some time,—then you have to support him as well as you can, and to lessen the irritation. It is often indispensible to give meat and malt-liquor. You see many persons, in phthisis, the better for having meat. Wine (as I said before) has a tendency to stimulate; and therefore should not be given; but ale will often be proper. In a great number of cases, you have to consider that the patient is just in the same situation as an individual having a large abscess in the extremities; which abscess, from pouring forth an immense quantity of fluid, has exhausted him. In that case, you must allow meat and beer, in order to support the patient; and you must administer opium to lessen the irritation; and, in phthisis, the treatment must be conducted precisely in the same way.

In this state of things it is very useful, when there is no inflammation,—no hæmorrhage, to give tonics; and of all tonics iron is by far the best. The use of what is called "Griffiths's Mixture" is well known. There was a Dr. Moses Griffiths, who made a mixture of iron and myrrh; which is a very good form. But the myrrh is nauseous; and, after making a number of trials, I am satisfied that the iron will do as well *without* the myrrh, as *with* it. The sulphate of iron answers exceedingly well; and when you recollect how often in this disease there is cough, out of proportion to the regular irritation that takes place, you may see that the iron may relieve the cough, even to a greater extent than it supports the constitution. I mentioned before, that many cases, which have been supposed likely to end in phthisis, have given way to the exhibition of iron. If the sulphate purge the patient too much, or excite the pulse, you may give the carbonate, which is rather the milder form of the two. If you exhibit two or three grains of the iron, three times a day, you will see patients gain strength up to a certain point; and their cough will diminish. The relief, it is true, is only temporary; but you do good for a time; and it is your duty to protract life, without considering whether it is useful to the patient or not. We are to follow the invariable rule of saving or protracting life, whenever it is in our power to do so.

In this state of things, though you cannot use the shower-bath, you may do great good, and produce great comfort, by sponging the patient well with vinegar and water. You may even check the hectic sweats, better by vinegar and water, cold or tepid, than by any other means. When, before the disease is formed, persons cannot bear a *cold* shower-bath, they can bear it *tepid*; and when the disease is fully formed, a *tepid* bath is frequently borne, though patients cannot bear

the *cold* bath. Tepid sponging is very beneficial; and it is better, perhaps, if vinegar be mixed with the water;—at least, so it is said. Many persons, when they have expectorated pus, have, from *tepid* sponging, come to bear *cold* sponging; and have found the greatest relief from it. That is to say, when hectic heat is upon them, they find it very comfortable; and, as I have mentioned many times, the feelings of the patient should always be consulted.

Among the means of lessening irritation, opium is one of the very best. I need not say, there are other things used for that purpose;—such as hyoscyamus, conium, and extract of lettuce; all of which do a certain portion of good, and are very often even more eligible than opium; because the latter may disagree. I believe the best preparation of opium is muriate of morphia; for it has seldom more than one unpleasant effect; namely, constipation; and even that is often a good thing in phthisis, because there is generally a disposition to relaxation of the bowels. A quarter of a grain of muriate of morphia, is equal to a grain of opium; and is more certain in its operation, than any other form of that drug. A solution of it is very cheap.

You may sometimes lessen the irritation, by making the patient inhale the vapour of various drugs;—by having a vessel three parts filled with warm fluid, and making a patient inhale through it. You must have two tubes to the vessel, so that the air may pass through the body of the fluid by means of one, while you are drawing it out by means of the other. The tube which admits the air must go to the bottom of the liquor, so as to convey the atmosphere through it; and the tube to be inhaled from, must be fixed above the liquor.* The agents which have been chiefly tried are, first, a very minute quantity of iodine, mixed with hydriodate of potassa; and, secondly, chlorine. I have seen more *mitigation* from the chlorine than from the iodine; but I have never seen a case *cured*. I have used them both perseveringly; but I never saw a case of phthisis cured by these means; and I do not believe that a case ever *was* cured. I have known a single drop of tincture of iodine, put into a pint of fluid, produce great irritation; but chlorine is borne much better. The mitigation afforded by it, however, is but temporary. The mode of

* The particularity of this description is by no means uncalled for; and a medical man, when he orders a patient to inhale vapours, must give his personal attention to the manner in which it is performed, if he wishes to have his intentions efficiently carried out. On one occasion, in a large hospital, when a patient with ulcerated sore-throat had been ordered to inhale steam, the Editor (on paying the evening-visit) found him with the tin-inhaler comfortably tucked under the bed-clothes, with a cork stuffed into the air-tube. The consequence of this was, that the patient was obliged to remove his mouth from the instrument after every inspiration; and, after all his laborious efforts, the supply of steam was very insufficient. The nurse (in every respect an excellent one) on being questioned as to the use of the cork, very naturally replied that it was "to keep in the steam;" and added, that she had been in the hospital eleven years, and never saw an inhaler used in any other way. There is nothing surprising in all this. Nurses are not expected to understand the principles of pneumatics. On instituting an inspection of the other inhalers in the hospital, every one of them was found duly provided with a cork!

using it is this:—into three-fourths of a pint of water, you may drop four or five minims of a saturated solution of chlorine. It is best to begin with one or two minims, and to increase the quantity gradually, as the patient can bear it; but if you at last arrive at a quantity which he cannot bear, you must then desist, and go back to what he can bear. Some have recommended the exhalations of tar. Tanners, as well as butchers, are said to escape the disease; and I have employed the liquor from tan-pits, in which there is an infusion of oak-bark. I have made people inhale it; and some have found considerable relief. Others, however, have found the smell so unpleasant, that they could not go on with it. I have not used it long; but as to its curing the disease, I should imagine that is out of the question. I believe that no means whatever will affect so desirable a purpose.

The great indication, when phthisis is once established, is to subdue inflammation if you can;—whether it occur in the form of pleuritis, or bronchitis, or peripneumonia. Besides this there is an indication, on the other hand, to support the strength by nourishing food and tonics; and a third indication is to subdue irritation by narcotics. You will find it necessary to attend to another indication;—the removal of urgent symptoms of various kinds.

You will continually find a person sweating so profusely, that his strength is thereby greatly diminished, and this may often be subdued by washing him all over with tepid vinegar and water, several times a day; or by the exhibition of sulphuric acid; and sometimes, again, by superacetate of lead. You will also frequently have to subdue another evacuation, which is purging. This, of course, is to be accomplished chiefly by astringents and opium. Unfortunately, the more you subdue one evacuation, the more you increase the other. Frequently, when you check the sweats, the purging becomes more intense; so that while you are lessening the sweating by tepid ablution, it is safe with vinegar and water, for example, to give astringents, lest diarrhœa should suddenly begin. Diarrhœa is one of the most tiresome symptoms in consumption; and very frequently astringents and opiates do not succeed in arresting it, on account of the inflammatory state of the mucous membrane; and yet the patient is too weak to enable you to apply leeches; and suffers so much altogether, that it is very painful to apply blisters. In many cases, fomentations or poultices of bran applied to the abdomen, will be as good means as you can adopt. Frequently the largest doses of opium (such as will produce great stupor), and the largest quantity of astringents (such as almost overload the stomach), have no tendency to check the diarrhœa. For a long time they may succeed; but at last, in most cases, the diarrhœa becomes so severe and obstinate, that they lose their effect. It is remarkable what a large quantity of astringents and opium you may give, with little or no benefit. However, we must do our best; and astringents and opium are certainly the best modes of checking the diarrhœa. Frequently there is ulceration of the intestines; and among the astringents, you find

sulphate of copper answer better than any other. It has a tendency to produce sickness; but that may be subdued by hydrocyanic acid. If you exhibit sulphuric acid, it is generally necessary to guard it by laudanum; for its acrimonious qualities, when given by itself, tend to increase the affection of the bowels.

Certain remedies have been boasted of as being capable of curing consumption; but there is no reliance to be placed on any of them. You are continually asked about the propriety of Iceland-moss, and things of that description. There is no harm in them. On the contrary, they are good so far as they are nutritious and bitter; and are very proper things to be given; but there is no hope of saving a patient by them. You will read accounts in which it is stated, that a large quantity of vinegar has cured the disease. Some persons give, in the course of twenty-four hours, about seven ounces of vinegar mixed with seven ounces of water, and sweetened with two ounces of refined sugar; but fair trials have been made with it without success. The balsams have also been recommended; but sometimes they heat the system excedingly, and increase the inflammatory state. Myrrh has been recommended by some; but I believe it does no more good than any other tonic. We have also had the sulphate of copper strongly recommended to us; and it does alleviate the symptoms. I have seen it, I think, when guarded by opium, not only check the diarrhœa, but diminish the copiousness of the expectoration; but it has no specific virtue. Some have recommended us to give a person an ague; but so many persons die of consumption, who have ague, and consumption is so common in aguish parts, that there is no reliance to be placed on this; and it would be great cruelty to give a person another distressing disease, —such as ague,—for the mere chance of doing good once, perhaps, in a thousand cases. Little more can be done than to lessen inflammation, support the strength, lessen irritation, and subdue urgent symptoms; for after all you can do, persons generally die of the complaint. The disease goes on progressively, and we can lessen suffering; but that is all; although, as I have already said, no doubt the disease may be *prevented* by great care.

It is said by Dr. Young, in his work on Consumption, that one-fourth of the inhabitants of Europe die of phthisis. This is a sort of Bibliographia Physica; for the author refers to every work on the subject written previously to his own. Years ago it was calculated, that a thousand persons died of the complaint, in Great Britain, every year; but, in Europe altogether, we are told by Dr. Young,—and I dare say we may depend pretty much upon his estimate,—that one-fourth die of the disease.* The mortality in this country is greater than in Paris. Whereas one in *four* dies of this complaint in Great Britain, only one in *five* dies in Paris, and at Vienna only one in *six*.

Symptoms arising merely from elongation of the uvula have very

* "A Practical and Historical Treatise on Consumptive Diseases; by Thomas Young, M.D. F.R.S."

often been mistaken for real phthisis.* This is a little point worth knowing. When the uvula is elongated,—hanging from the pharynx,—it sometimes produces constant cough; and this leads to a constant expectoration of mucus, and in some cases to emaciation. It happens, now and then, that extreme emaciation has been the consequence of an elongated uvula. Patients, from the constant cough and expectoration, have become emaciated; the tongue has become white; flying pains have taken place in the chest; loss of appetite has occurred; the pulse has become small and unequal; a pain has been felt in the larynx, from constant efforts being made to expel the mucus;—all of which symptoms have arisen from an elongated uvula; and therefore, whenever you are consulted by a patient labouring under these symptoms, it is right to look into the pharynx.

The complaint may be promptly remedied by snipping off the lower half of the uvula, with a pair of scissors. The pain is but momentary; there may be a little bleeding; but the operation is perfectly safe. It is very seldom that such severe symptoms will occur as to be mistaken for phthisis; but sometimes such a circumstance has taken place. Very often, however, persons have a tire-

* There are few subjects within the range of medical science, that modern investigation (powerfully aided by the stethoscope) has more strenuously sought to elucidate, than that of which we have just completed Dr. Elliotson's masterly exposition. The fearful ravages of pulmonary consumption; the insidious nature of its approach; the rapacious cruelty with which, as if in bitter mockery of our dearest sympathies, it loves to select the young and the beautiful for its victims; and the little avail hitherto attending our exertions to wrest the prey from the merciless spoiler;—all this has combined to impart to its investigation no ordinary share of interest. Nor have the difficulties attending the pursuit caused the zeal of its followers to relax; for obstacles in the path of the real votary of science, instead of paralyzing exertion, only lead to greater effort. It is a heartless apathy, equally unworthy of the philanthropist and the physician, that can look at the mass of disease yet unsubjected to the control of medicine, without humiliation at its extent, and anxiety for its diminution! And who shall say that its diminution, nay its final extinction, may not ultimately be accomplished? There are depths in science, and in medicine too, of which our present means of investigation only serve to show the profundity; but who will venture, either in the one case or in the other, to set bounds to the future advancement of knowledge? With the recollection of what has been already done, is there one in the whole range of diseases, against which the power of medicine shall be declared for ever unavailing? A conquest so noble as this, however, is not to be attained at once. It must be the result of patient and laborious investigations; of multiplied and varied experiments; of impartial and repeated observations. We must be content to ascend the steps, if we would ever attain the summit. It is on this account that every devoted student of medicine must hail, with pleasure, the light which has been thrown on this and kindred subjects, by the French school; and to those who have devoted their lives to an unflinching warfare with disease and death, and to the grateful task of soothing the pangs of suffering humanity, will be adjudged, by every properly constituted mind, a higher meed of applause, than to heroes and conquerors the most successful and renowned!

Various points of interest relative to this subject, are discussed by Dr. Graves, in two lectures which form part of one of his clinical courses;—courses distinguished no less by attractive vivacity of style, than by intrinsic excellence of matter. See the "London Medical and Surgical Journal," for March, 1833, (Nos. 61 and 62; Volume III; Pages 230 and 262).

some cough, which has been mistaken; so that blisters have been applied to the chest, when the symptoms have arisen from nothing more than an elongation of the uvula. With regard to local applications, the best are those which unite astringent with stimulating properties; but in cases where these fail, the operation of curtailing the uvula should be had recourse to.

PLEURITIS.

I now proceed to speak of diseases of the pleura; and, in the first place, of the most common affection of it,—*inflammation*. When the pleura is inflamed, there is of course pyrexia. If the inflammation be idiopathic,—if it be consequent on some local irritation, it usually begins with shivering; and is followed by quickness of the pulse, and all the symptoms of pyrexia. The pleura is a serous membrane; and therefore, in most cases, you have a firm hard pulse;—not invariably, but generally. Then, as to the *local* symptoms, you have almost always severe pain,—an acute, stabbing, sharp pain;—the least attempt at a deep inspiration augmenting this pain exceedingly. This pain is not increased on the *least* pressure. You may press the integuments down upon the ribs, without aggravating it; and you may press moderately between the ribs; but if you press very firmly between them, and still more firmly upon the ribs themselves, you of course will press upon the pleura, and then the pain will be increased. In severe cases there is extreme pain, so that hardly any pressure can be borne; and I have known persons unable to lie on the side, on account of the pressure exerted by the part against the bed. A case must be very severe for there to be pain on *slight* pressure. In truth, you may generally distinguish pleuritis from rheumatism of the muscles of the chest, among other means, by this;—that in the latter case the least touch causes pain and soreness;—such a pressure as will not affect a patient labouring under pleuritis;—pressure on or between the ribs, and at the back or front of the chest. In acute rheumatism, for the most part, there is profuse sweating;—such as there is not in pleuritis; but there is not, in rheumatism, that general disturbance of the constitution, which occurs in pleuritis. In pleuritis, the whole constitution is very much disturbed; and there is not, by any means, that severe pain which there is in rheumatism. In general, you make out the difference of the cases very well. The pain, in pleuritis, is only felt at the lowest part of the chest; or, at least, low down in the chest;—not in front, nor at the back; but towards the side. I suppose the disease has had its name "*pleuritis*," from the pain being observed to be situated in the side (πλευρα); and not from the pleura being inflamed.

The respiration is rapid in this disease, because the patient cannot make a deep inspiration; and to compensate for the want of depth, he breathes the more quickly. The pain is increased by coughing; and it is also increased by speaking. Sometimes patients cannot speak at all, on account of its severity. In general, we make out the

nature of the disease sufficiently, without listening to the chest. This affection is one of the best marked of any with which I am acquainted. There can be no difficulty, except in distinguishing it from rheumatism; and, in general, if you attend to the points to which I have just referred, you will not meet with any difficulty even on that head.

The seat of the pain will sometimes vary in the course of the disease. It will sometimes cease on one side, and be felt by the patient on the other; and it is said that, now and then, the pain is not felt in the part which is found inflamed after death. The pain is felt in the opposite side during life; and opposite to that in which we find marks of inflammation after death. It is said, though I do not recollect seeing such a case myself, that sometimes no pain has been felt at all; and the practitioner has been surprised to find, at the autopsy, violent marks of inflammation. Usually the patient lies best on the opposite side; but sometimes he can lie most easily (or lie *only*, indeed) on the affected side. The cough which attends this disease is usually dry, and not very frequent; and sometimes it is altogether absent.

On listening to the affected part, you generally find less respiration there, than there should be. The part is not much expanded in respiration. You observe that the ribs, at that part, do not move so much as in other parts of the chest that are healthy. Less respiration occurs there; and, on that account only, there would be less respiratory murmur; but there is sometimes considerable effusion of lymph or of serum; and that, of course, will obscure the respiratory sound. After a time, effusion takes place in a decided manner; and then you have a dull sound upon percussion, and no respiratory murmur is heard at the part. There is no *crepitous* rattle heard, as in peripneumonia; and no *sonorous* or *sibilous* rattle, as in inflammation of the substance of the lungs; and therefore with this absence of sound, and the acuteness of the pain, there is in general no difficulty whatever in saying, that the patient is labouring under inflammation of the pleura. Now and then, you will have pleuritis united with peripneumonia and bronchitis; so that you have crepitous rattle as well as acute pain; or you have sonorous and sibilous rattle; but the acute pain, which is unknown in peripneumonia and bronchitis, sufficiently shows that those affections are complicated with inflammation of other parts.

If you inspect the part after death, you find nothing more than I mentioned, when speaking of inflammation of serous membranes in general. Sometimes there is diffused redness; sometimes there is a *striking* redness, and an effusion of lymph on or within the pleura; and sometimes there is serum, occasionally quite clear, but for the most part turbid, and of a yellow colour, with more or less flakes of lymph swimming in it.

The disease arises, in almost every instance, from cold and wet. It will sometimes arise from a local source of irritation; for example, from wounds, from the effusion of substances into the pleura, or from

ulceration of the part; but by far the most common cause, is the application of cold. The treatment I need not dwell upon. It is nothing more than that for any common inflammation. Bleeding, mercurializing, starving, and purging, will cure it, just as easily as any other inflammation.

When effusion takes place, you may always ascertain it to a certainty. Sometimes the patient loses his pain, and may even say he is a great deal better; but notwithstanding that, if you listen to the chest, you may ascertain that he is in considerable danger. Indeed, in such cases, you may be satisfied, from the quickness of the respiration, or the difficulty of it, that all is not going on well; notwithstanding that the patient declares himself better. But if, in every case of pleuritis, you make a point of examining the chest by the ear, you will ascertain to a nicety when effusion takes place, and to what extent it has occurred. In cases unattended by danger altogether, you will observe this effusion; although a person who does not use his ear, would not know that it existed. When effusion is present, there is a dull sound on percussion, and a want of respiratory murmur; and, besides that, if the effusion be inconsiderable, you have in most cases a very peculiar phenomenon; which is, that when the patient speaks, the noise resembles that of Punch. It is a sort of nasal twang. You would fancy there was a showman near, speaking for Punch. It is a sort of cracked sound; and is sometimes silvery and vibrating. This is heard much better, in general, at the *back* of the chest than at the *front*; and as long as this exists, you may be sure the effusion is not very considerable. When it becomes considerable, you have not only a complete dull sound on percussion, and a want of respiration; but you do not hear the voice at all in the part;—the echoing of the voice through the tube, is not to be heard at all. If the effusion should fortunately decline, then, as it does so, yon will hear this peculiar sound again. It is something like the bleating of a goat; and is called *ægophonism* (from *φωνη, sound* or *voice*; and *αιξ, a goat*);—the sound of a goat. I think when you have once heard this sound, you can never mistake it again. It is a sound which but few persons have heard; because, in general, people do not listen to the chest in this disease; and when it it is heard, it is only in a *moderate*, not in *great* effusion. The symptoms at large are not severe at the moment it is heard; and therefore those who are not in the habit of using their ears, in this particular disease, do not think it worth while to examine the chest at that period. You will hear it much the best by applying the stethoscope firmly to the chest; and then putting your ear but lightly to the stethoscope. You do not hear the voice run through the tube, as in pectoriloquy. It does not, by any means, take place to the same degree. It rarely, indeed, enters the tube at all; and much less does it seem to pass *through* the tube. There is no difficulty in learning these signs. You have only to hear them once; and you will remember them again. Laennec says he noticed it in every case of pleuritis that he examined, for five years preceding the

publication of his second edition. Where the effusion is very moderate indeed, then it is not sufficient to produce the sound; and if it be excessive, the phenomenon cannot take place at all. Laennec says he has observed it, where there did not exist in the chest above three or four ounces of fluid. It will occur, not merely when there is *serum* effused in the pleura; but also when the serous membrane pours forth *pus*; as you know that it sometimes will. Altogether it is a variable symptom; because it can only occur when the effusion is moderate.

This phenomenon is explained, by Laennec, to be owing to the compression of the bronchial tubes by fluid, conjointly with the transmission of the sound of the voice through a thin *layer* of fluid. If the layer be very thin, it is not sufficient; for the sound must pass through a certain body of fluid; and, indeed, a very thin layer of fluid would not be sufficient to compress the bronchial tubes. It must reach a certain amount, both in order to compress the bronchial tubes, and to be the medium of this sound; for if there be great effusion, the bronchial tubes are so compressed, that there is but little air in them; and then the sound cannot be heard. Whether Laennec's explanation is correct, I will not pretend to say.

If you change the level of the fluid, you will change the seat of the œgophonism. If the patient be upright, it will be of course over the highest portion of fluid; but if the patient be lying down, then you will hear it where the layer of fluid is the thinnest. If the patient lie down, you will not hear it where there is a great collection; but at a higher point, where the layer of fluid is thinner.

Pleuritis is sometimes a *chronic* affection; and here it is that this particular sign of œgophonism is essentially serviceable. When pleuritis occurs in a chronic form, it is every day mistaken for phthisis. I have seen instances of this over and over again. Sometimes the *acute* form of the disease degenerates into the *chronic*; but more frequently the latter is a very insidious affection; and creeps upon the patient slowly. The general symptoms so much resemble consumption, that the patient is supposed to have gradually fallen into that affection; for this chronic form of the disease is frequently attended by no pain, or only by *obscure* pain; and yet the patient has pyrexia, cough, and expectoration. He will become hectic, and waste away; the pulse will be constantly quick, and he will die. On opening the body, a large quantity of pus will be found in the pleura; while the lungs themselves, perhaps, are entirely sound. Frequently, it must be allowed, in this chronic pleuritis, the lungs labour under phthisis. Very frequently, when chronic pleuritis exists, tubercles exist in the lungs at the same time; but frequently they do not; and at any rate if they do, it is very common for the pleuritis to have been the sole cause of death;—none of the tubercles having proceeded to ulceration.

In this chronic form of pleuritis, adhesions are not formed to any great amount. In the *acute* form, the effusion leaves adhesions. Sometimes you find the whole side adherent;—the pleura *pulmonalis*

to the pleura *costalis*; but in this *chronic* form the collection is often altogether, or the greatest part of it, pus; and any adhesions that form, are frequently slight portions of lymph that are effused. They are so soft, that they are not capable of becoming organized; but as they are mixed with serum, you find after death, that the two substances are united; or, at least, that the one is mingled with the other. This fluid,—this turbid serum, or *puriform* serum, or this absolute pus, augments daily, till the lungs are compressed towards the spine, and towards the mediastinum; and sometimes they are so reduced, that a careless examiner has said that they have disappeared altogether. Just as careless examiners, in former days, said that in hydrocephalus the brain was destroyed, and that a person had been living for months without a brain; so the lungs have been compressed to such a degree, in this disease, that their existence has been altogether passed over.

Sometimes the affected side of the chest grows large; and if it be the left side in which the disease resides, the heart is pushed to the right; so that it beats on the *right*, instead of the *left* side. The disease is then called *empyema*, if the fluid be pus; but it makes no difference whether it be pus or serum. In these circumstances, the ear may not be necessary in order to recognize the disease; for you may see the side increased in size. It appears, to the eye, to be larger than the other; and on measuring it, you find one side of the chest half an inch, perhaps, or an inch, larger than the other. Sometimes you can discover fluctuation,—just as in other instances of a collection of pus; but now and then there is no enlargement of the chest, and no fluctuation to be felt.

In these cases, the want of sound on percussion, and perhaps the presence of œgophonism, will shew the nature of the disease; but the want of all hollow sound on percussion, together with the history of the case, will, in general, sufficiently shew it, without the occurrence of œgophonism. Œgophonism certainly does now and then occur; but still it is to be remembered, that if the fluid fill up the side of the chest, or nearly so, you cannot expect this phenomenon. It is only in a *moderate* collection that you will have this sign; and therefore a person may have the pleura full of pus without it; but if you have attended the patient from the beginning of the complaint, and from the beginning have been in the habit of noticing all the symptoms to be learned by the ear, in conjunction with the general symptoms, you will easily find that œgophonism has appeared and disappeared; and you know it has disappeared not from an *absorption* of the fluid, but from an *augmentation* of it, from this circumstance;—that percussion of the chest gave a dull sound, just in proportion as the œgophonism declined.

In this particular form of the disease, the making of a correct diagnosis is very important; because you may render a patient essential relief. You may save life; and in those cases in which you cannot *save* it, you may *protract* it. It was only two years ago, that I had a case of this description, in a young child almost at the breast.

The heart was pushed so much to the right side, that it was pulsatign there; and the nature of the case being perfectly clear, a lancet was plunged into the left side of the chest two or three times; and the child fortunately recovered, and is alive now. An operation is always safe in these cases. If the collection should point at a particular part, that is the spot at which you should make the opening; but if it do not point, then you should puncture between the eleventh and twelfth ribs. If you be in any doubt about the case, I should advise you to use a needle which has been invented by Dr. Davis. He has had a large needle made with a groove; which needle you may put into the side without any danger. When it is plunged in, if fluid exist, you will see it form a drop near the end of the needle. Whether there be water present or pus, it will escape to a certain extent; and if a drop of fluid come, you will be sure of the nature of the case. A small trochar may then be passed in; and you may thus draw off the fluid. It will be right not to draw off much at a time;—to draw off what only you consider to be a third or a half of what is there,—according to the size and age of the patient; and you may continue to draw it off at different times, till the chest is completely emptied. It has been the custom of Dr. Davis, I know, to pass in a piece of hollow bougie; and to let it remain there. The end of the bougie must be bent down, and fastened by straps of adhesive plaister; so that it may not find its way into the chest. Something must be put into the end of the bougie, to prevent the fluid from escaping too suddenly. The plug may be taken out every day, and a little fluid allowed to escape. Where the lungs are sound, this treatment has been successful. I have not seen many cases of this description; but Dr. Davis, of the London Hospital, has had several; and now he can count up a considerable number, where life has been saved entirely by this method.

When effusion takes place, there is a dead sound on percussion; and no respiratory murmur is heard. This is the natural result of the part being no longer filled with air, but with pus; which has driven the lung aside or upwards, and compressed it below. When a lung has become solid from air, you have this same auricular phenomenon. If the lung become solid from inflammation,—if the substance be converted into something like liver, so far as the solidity is concerned,—you must have a dead sound on percussion, just as if fluid were there. No more air exists in the lung when it has become solid, than when fluid abounds in the chest; and in these circumstances you have equally no respiratory murmur; because the lung being solid, it is unfit for its functions. But when a lung thus becomes solid from inflammation, it becomes so solid throughout, that there is no respiratory murmur at the *root* of the lung; for that part is equally inflamed with the rest; whereas when the dull sound of the chest, and the want of respiratory murmur, arise from a collection of fluid, it rarely so compresses the lung, but that you may hear respiration at the posterior part; that is to say, along the sides of the spine, about three fingers breadth from the vertebral column. Respiration

also continues there when fluid is collected. However great the effusion may be,—even if the lungs be so compressed as to be found with difficulty after death,—not presenting themselves at first,—still I believe that the respiratory murmur is heard at the back and root of the lungs, in the situation I have just stated. This murmur, too, is heard before the effusion is very considerable; and it is heard for a length of time under the clavicle, at the highest part of the chest. The collection of fluid does not mount so high, but that, for a considerable time, you may hear the murmur immediately under the clavicle. When the want of a hollow sound on percussion, and the want of the respiratory murmur, arise from the lung becoming solidified through inflammation, you may very rapidly cease to hear the respiratory sound under the clavicle. The inflammation may be so quick in its operation, and solidify the lungs so soon, that you may hear no respiratory murmur on either side of the spine; because all parts of the lungs may be inflamed. But when the want of a hollow sound on percussion, and the want of a respiratory murmur, arise from effusion compressing the lung, it is a long time before they are lost at the upper part of the chest, under the clavicle; and at the very last, I believe you will always hear the respiratory murmur at the back; about three fingers' breadth on each side of the spine.

The part of the chest where you should first listen for that peculiar phenomenon of the voice called *ægophonism*, is from about one to three fingers' breadth from the lower angle of the scapula, towards the nipple. The reason why you most frequently hear ægophonism between the lower angle of the scapula and the nipple is, that it is below this part that the fluid generally accumulates; and if the whole lung be covered with effusion, still the thickness of the body of the fluid is always less at the posterior part. You can hear this phenomenon here, when you can hear it nowhere else; because the fluid cannot accumulate so extensively in this situation, as in other parts. After the phenomenon has declined in the *front* of the chest, from the great accumulation of fluid, you will still hear it at the *back*, in the particular part I have indicated.

In mentioning to you that the accumulation of fluid in the left pleura, sometimes pushes aside the heart,—so as to produce the extraordinary phenomenon of the heart beating on the right side,—I might have stated that before auscultation was known, though after percussion had been introduced to the medical world, and treated with neglect in this country, I saw a case that puzzled me completely. It is many years ago; and I should not be so puzzled now. In a case of this disease, the liver was so pushed down, that it was felt below the navel; and I being young in practice (though, however young a practitioner might be now, he could not make such a mistake) had no idea of the nature of the disease; but supposed that the man had an enormously enlarged liver; and so did every body else that saw him. The man had a very enlarged abdomen; and the liver could be felt as low as I have stated; but, after death, that organ was found perfectly healthy; but, like the

heart, in other cases, it was not in its "right place." A vast accumulation had taken place in the right pleura; which actually pushed down the diaphragm, and the liver along with it; so that the case was completely misunderstood. If auscultation had been then devised,—if all the phenomena had been known *then* that are known *now*, the matter would have been very clear. We should have ascertained that there was no enlargement of the liver, from this circumstance;—that there must have been a dull sound on percussion, all up the right side of the chest; and, on listening for respiration on the right side, there would have been none heard. It would have been perfectly clear, that the right side of the chest was occupied with something else instead of air; and if the case had been observed throughout, of course there would first have been noticed œgophonism,—the bleating sound; and afterwards it would have disappeared; so that no mistake could have been made. An operation might have been performed, and the man might have recovered; but, as it was, he died. There was a large collection of liquid in the right side of the chest; and every one was quite surprised to find it there. I was not at the inspection; but such was the result. An accumulation in the right side of the chest, therefore, may push down the liver in an extraordinary manner; just as accumulation in the *left* side, may push aside the heart. By the careful use of the ear, the nature of the case (as I have already observed) might have been fully cleared up; and, even now, cases of cheonic pleuritis are every day mistaken for phthisis.

In this chronic form of the disease, as the accumulation takes place slowly, respiration is not so difficult as you might imagine. The other side of the chest gradually does more and more duty; and the patient feels the inconvenience increase so gradually, that it is not such a source of distress to him as you would imagine. In *acute* pleuritis, when the effusion is very considerable, respiration is necessarily rapid; and there you have infinitely more difficulty of breathing, than if the same quantity of fluid were effused in a *chronic* form. This is nothing more than an instance of a general fact;—that when anything peculiar comes on slowly, and is increased moderately, it is not productive of half the excitement, that it would be if it came on quickly.

When the fluid has thus compressed the lung, although nature may cause its absorption, or although a medical man may occasion its escape by an operation, it is possible that the lungs may never expand again; and this want of expansion may occur, either from the great compression they have undergone, or from the production of such firm adhesions, that they are effectually bound down. Inflammation may not only have induced the accumulation of fluid, but may have produced such an effusion of fibrin, as to form firm bands, binding down the lungs; and, from either of these circumstances, the lung may never recover its elasticity. Laennec declares that, on inspection, he has uniformly found these firm adhesions; and he calls them *fibro-cartilaginous*;—not *fibrous*, as we generally see adhesions;

but *fibro-cartilaginous*. However, as the lungs have been known to expand again in some degree; and as the chest, which was sunk in, in consequence of the compression of the lungs, has in some degree recovered its form,—we can hardly suppose that the lungs, in every case, are prevented from expanding, merely by adhesions. Of course, if the lungs will not expand, the chest will become flattened on the sides, from the pressure of the air; but it has been known that the chest, after it has become flattened, has enlarged again, —from the lungs having recovered their powers; and if the want of expansion in the lungs, for a great length of time, arose from fibro-cartilaginous bands, it is not likely that they would ever have yielded so as to allow of the expansion of the lungs again. The extreme compression of the lungs, seems to me to be quite a sufficient cause for the want of their subsequent expansion, without having recourse to the supposition that, in every case where they do not expand again, there must be firm adhesions. The whole lungs are so compressed,—so squeezed together, and become so fixed, that they resemble muscles;—muscles with fibres too minute for detection. You would think they were muscles with exceedingly fine fibres; and I may mention, that when the lungs are so compressed, the colour is either red or grey.

If the lung has been so compressed that it will not expand, and the fluid has been absorbed or let out, and no more has formed, the ribs on that side fall, and lie closer together than they should do. The shoulder, on that side, falls below the other; and the muscles (especially the pectoral) waste,—both as to breadth, and as to length. The muscles waste in proportion as the side becomes contracted; and they are found, on actual measurement after death, to be diminished; and still more do they appear to the *eye* to be diminished. Even the spinal column at length inclines, in some cases, to the opposite side. Most practitioners must have seen instances of persons, with their ribs lying close together on one side; with the shoulder depressed, and the spinal column bent to the other side. The nature of such cases, however, was not understood, nor were the general phenomena of the case itself well described, before the appearance of the first edition of Laennec's celebrated work. I recollect, very well, having had an individual pointed out to me, as a decided proof of the power of muriate of lime in scrofula and phthisis. After suffering very long from pectoral complaints, and being put under the long exhibition of muriate of lime, the man recovered his health; but one side of the chest was manifestly smaller than the other; and he was shewn to every body as a man who had long had phthisis, and had wasted away; but all the ulcers had healed up, owing to the power of muriate of lime. It was considered that the lung had wasted away from ulceration; and the contraction of the side of the chest, was thought a sufficient proof of it; because he had continually expectorated from irritation of the bronchia; and it was also thought that the ulcers had been completely healed, by means of the medicine. I supposed, not knowing better,—for

nobody knew better in those days,—that this was actually the case; and therefore did not attempt to deny it. There is no doubt, however, that this was not a case of phthisis at all; but that it was a case of chronic pleuritis, in which great effusion had taken place; which effusion had afterwards been completely absorbed, by the power of nature; and the lung had never been able to recover itself from its compressed condition. You will see, in Laennec's work, a drawing of an individual, with one side of the trunk lower than the other;—through the falling in of the chest, in the manner I have now described.

Laennec considers, that when a case of this description is well marked, it arises from that form of pleuritis, which is attended by hæmorrhage into the pleural cavity. It so happens, that when the pleura is inflamed, an effusion sometimes takes place into it;—just as occasionally occurs from mucous and serous membranes. I mentioned, when speaking of hæmorrhage, that these membranes will produce an effusion of blood; *why*, we cannot tell; but sometimes it is the case. This sometimes happens in the case of the pleura. Blood is effused; and Laennec considers it is in such instances, that this extreme compression takes place. There is, however, no proof that it *always* results from hæmorrhagic pleuritis. Sometimes it arises from that source; but sometimes I am satisfied, there is no hæmorrhage in pleuritis. On the contrary, when the fluid has been let out, it has been proved to be mere pus, without any admixture of blood; and yet contraction of the chest has occurred;—just as where blood has been let out in conjunction with the pus. If it occur more frequently (as Laennec says) after hæmorrhagic pleuritis, and these dense fibrocartilaginous bands, formed by a cohesion of the fibrin in the effused blood upon the costal pleura, were always discovered in contraction of the chest, still I should not regard the thickness of these bands of fibrin, as the *cause* of the contraction; but as *effects*, no less than the contraction itself, of the inability of the compressed lung to expand again.

Bloody fluid, just like pus, is not so rapidly absorbed as mere serum. When blood is effused, the lung is irrecoverably compressed, by the duration of the pressure; and from the slow manner in which the elasticity of the chest, and the pressure of the atmosphere,—resisted as they are by the natural structure of the chest,—can bring down the side to the flattened lung, a space probably exists, greater or smaller, for some time. Laennec, indeed, seems to contradict himself; for he says he is of opinion, that contraction of the chest may be found, in an equal degree, after the disease has produced merely cellular adhesions; so that, in some parts of his work, he seems to give up the opinion, that the inability of the lungs to recover always arises from these firm fibrous cartilaginous bands. He also allows, in another part of his work, that the contraction is owing, not to the adhesions themselves, but to their slow formation. The more slowly these are formed, the less chance will the lung have of expanding. He says that if the effusion be copious, and conse-

quently the resolution of the pleuritis slow, the contraction is evident long before the complete absorption of the fluid; but he says, that the more rapid the absorption, the less chance is there of contraction; sincethe longer the lung is compressed, the greater is the loss of its natural elasticity. In short, Laennec himself does allow, that the degree of the continuance of the compression through the effusion, is the cause of the inability of the lung to recover itself. I myself have frequently opened persons, in whom the lung has never recovered itself; and yet there have been no fibro-cartilaginous bands, and bloody fluid; so that the long continuance of the compression, appeared sufficient to explain the inability of the lung ever to recover itself.

When the chest contracts, in chronic pluritis, the diminution may begin at an early period of the effusion; but may not be perceptible for months. Of course it can only be a certain degree of contraction of the chest that is observable; and those persons who are not in the habit of examing patients with the eye and with the hand,—who consider those as mechanical means, fit only for the surgeon;—those who are not in the habit of making patients undress, and are not accustomed to handle them, except to feel the pulse;—such persons will, of course, be ignorant, for a great length of time, of contraction of the chest. It may be going on for a considerable period; and they may know nothing at all about it, till the patient makes the discovery, and announces it to his medical attendant. When the chest is contracted,—when fluid no longer exists, but the lung is compressed, and the thorax goes down upon it,—then there is a dull sound upon percussion, just as when pleuritis existed; and sometimes you have not only a *dull* sound, but a true *fleshy* sound;—the same sound as if you struck the shoulder or the thigh. But notwithstanding you have this dull sound, the respiratory murmur is heard a little. Probably at the lower part of the chest, where the effusion had taken place first, and must have ceased the last,—for of course it is to the lower part of the chest that the fluid will gravitate at first as well as at last,—there will be no respiratory murmur; but it may be heard faintly at the upper part.

When the inflammation has ceased, and the effusion to which the inflammatory state gave rise has ceased, the walls of the chest are flattened down proportionately to the contracted dimensions of the lung; and nature has effected a cure, exactly in the same way that a surgeon effects a cure of hydrocele;—by adhesion. In the case of a hydrocele, there is a serous membrane; and when it is inflamed by an injection, fibrin is poured forth, and also serum. The serum is at last absorbed, but the fibrin blocks up the cavity altogether; and that is exactly the state of the parts in the cavity of the chest. When nature has effected a cure, in the way that I have now described, the person is more or less deformed for life; but suffers little inconvenience. The general health may be excellent. Laennec mentions the case of a distinguished surgeon at Paris, whose chest was contracted ofter pluritis, which took place in youth; and in whom percussion, when Laennec wrote, gave a dull sound at the lower

and lateral parts of the effected side of the chest; and the respiratory murmur was weaker there, than on the opposite side; but this surgeon had a strong voice; and contrived to lecture once, or even twice a-day, for an hour at a time, without any inconvenience.

Besides the surgical treatment of such a case,—letting out the fluid,—it is necessary to support the strength, and to lessen the irritation by means of opiates,—to use the same constitutional means that you would employ, in the cuse of a large abscess.

HYDROTHORAX.

It sometimes happens that an effusion of fluid takes place into the pleura, without much inflammation. A quantity of serum is effused there; sometimes quite clear; sometimes more or less turbid, and of various characters; but it is not pus, nor is it the result of inflammation. This is commonly called *hydrothorax* (from *ὑδωρ, water*; and *θωραξ, the chest*). You will recollect that, when I spoke of dropsical effusion, I mentioned that effusions in a serous membrane were sometimes puriform, sometimes purulent, sometimes bloody, and so on; and I mentioned that sometimes they arise from *violent* inflammation, somtiemes from *moderate* inflammation, and sometimes, apparently, without any inflammation at all. These were general observations. Now the pleura is in the same predicament as all other serous membranes. It is frequently in the state I have now mentioned from inflammation; but sometimes it contains a quantity of thin fluid, where there was scarcely any inflammation at all,—where there was no necessity to employ antiplogistic means; and sometimes it contains a large quantity of serum, without our being aware (not only during life, but likewise after death) that inflammation has occurred;—in fact, without the least sign of inflammation. Effusion may take place in the pleura, as in other parts, without any signs;—just as a person may sweat, and pour forth fluid, without any inflammation whatever.

A genuine idiopathic case of hydrothorax (water in the pleura) is a very rare thing. You will hear some people who never examine the chest during life, but who open bodies after death, speak of hydrothorax as the most common thing in the world; but when it does not arise from inflammation, hydrothorax is a rare disease. When there is any other disease in the chest, it is common for effusion to take place; but for it to take place, except as a consequence of inflammation, or some organic disease in the chest, is very rare. I do not recollect half a dozen such instances.

When hydrothorax occurs, whether it is the result of a very slight kind of inflammation, or is produced by bronchitis, or peripneumonia, or disease of the heart, or any other disease, the symptoms discoverable by the ear, are just the same as those that occur when the fluid is puriform or purulent, and the result of decided inflammation. You have, of course, a dull sound on percussion, from the presence of fluid; and there is no respiratory murmur at the lower part, although you may still have it at the *upper* part, (unless the

chest be completely filled), below the clavicles; and you have it on each side of the spine, where the fluid does not compress the roots of the lungs.

The general symptoms are difficulty of breathing, deficiency of urine, swelling of the legs, cough, and a sudden starting from sleep; but all these things, when they do occur with a certain degree of effusion into the chest, are more frequently the result of other diseases in the chest than of hydrothorax. In almost every case of hydrothorax you open, you find other disease sufficient to explain the symptoms. In most cases you find disease of the heart, or chronic disease of the lungs; and in those affections you have exactly the same symptoms; although there be not the same quantity of fluid effused into the pleura. I have frequently opened patients, who have been supposed to have died of hydrothorax; whereas death arose from disease of the heart. You will find cases set down as hydrothorax;—where the legs are swelled; where the breathing so difficult that the patient is unable to lie down; where he has orthopnœa and deficiency of urine; and where there is a collection of symptoms which are pronounced to be hydrothorax; whereas, if you listen to the chest, you hear respiration all over it; and if you strike the chest, you hear the usual sound; but on listening to the heart, you hear disease of that organ; or on listening over the chest, you find sonorous and sibilous rattles;—shewing that there are other diseases present. The fluid that occurs in the chest, when it is not puriform, is usually the result of some other disease in the chest. In cases of effusion into the chest, in all circumstances, you have the same auscultatory phenomena;—not only the want of a respiratory murmur;—not only the want of a hollow sound on percussion; but, if the fluid be not considerable, you have also œgophonism. No matter what the disease is, the phenomena are the same.

If you can ascertain that there is really hydrothorax, to an amount sufficient to explain the symptoms;—that there is a dull sound all over the chest on percussion; that the respiratory murmur is not heard any where except just below the clavicle, and at the root of the lungs; and if you see the general signs of dropsy, and the absence of disease of the heart;—you then may presume that the extreme difficulty of breathing, the swelling of the legs, and the scantiness of the urine, arise from a collection of fluid in the chest;—especially if you hear œgophonism; and if you observe that the dulness of sound, and want of respiratory murmur increase,—reaching higher and higher. In such a case you ought to let out the fluid. Exactly as in other cases, where the presence of a collection is doubtful, you may use the needle which I spoke of, to ascertain whether fluid exists or not. It would be well to do it in every case; because it gives no pain to the patient, and is perfectly safe.

But before these measures are taken, it would be right to give the common remedies for dropsy, where there is no inflammation;—to give diuretics. Digitalis answers an excellent purpose, and also squills; more especially if united with a small quantity of mercury,

which appears to increase the diuretic effect. You may do a great deal of good by these remedies, in all cases of chronic difficulty of breathing,—whether there is effusion of serum or not; because there is continually a great collection in the air-cells, and perhaps also in the cellular membrane of the lung, which impedes respiration. When there is not hydrothorax, properly speaking, you continually find that diuretics are very useful, by causing an absorption of the fluid which is pressing the cellular membrane of the lungs, or filling the air-cells themselves. I mentioned, when speaking of dropsy before, that diuretics answer more purposes than one.

PNEUMATO-THORAX.

The pleura is sometimes distended by air. This disease is called, by Laennec, "*pneumo*-thorax;" but very improperly so. It ought to be called "*pneumato*-thorax;" for "*pneumo*-thorax" means something about *lung* and chest; but "*pneumato*-thorax" means something about *air* and chest. We have such a word as "*pneumatocele*;"—signifying a swelling produced by air; and when air exists in the thorax, we ought to say "*pneumato-thorax*;" because πνευμα is the Greek for "*air*;" and, according to common analogy, we ought to change the genitive into το. We say "*hæmatocele*," and not *hæmocele*. Laennec, therefore, is wrong in the name which he has given to the disease; which consists of air being present in the pleura. This, however, is unimportant; and one is not disposed to dwell upon words; only when a new term is invented, it is right to make it legitimate according to other words. With words that have been long established, we must be contented, and not be over nice.*

When air exists in the pleura, it of course gives rise to the same effects of distention, that the existence of pus or serum does. The intercostal muscles swell out a little; and the diaphragm and liver, in the case of the right side, are pushed down. You may predict what will be the signs to the ear. There will not be a *dead* sound, as in the case of the effusion of pus or serum; but on striking the chest, you will have a *hollow* sound; though on listening to the chest you will, as in hydrothorax, have no respiratory murmur. The air that is inclosed is not the air of respiration; but exists externally to the lungs; and therefore it does not give any respiratory murmur; but there is this great difference;—that if you strike the chest, notwithstanding there is no more respiratory murmur than in the abdomen, yet you have a fine clear hollow sound. You see, in this

* The following additional observations on this subject, are taken from a note at page 5 of Dr. Elliotson's work on Diseases of the Heart:—"The name '*pneumo*-thorax,' adopted from Itard by Laennec, is evidently improper. It should be '*pneumato*-thorax.' Such compound words are always made from the dative singular;—the final letter being changed into *o*, if it be any other vowel. We thus have '*utero*-gestation,' '*cerebro*-spinal,' '*hæmato*-cele.' The genitive and dative of αἷμα, are αἵματος, αἵματι. The genitive and dative of πνεῦμα, are πνευμάτος, πνευμάτι; and the compound word should be '*pneumato*-thorax.' In truth, we already have 'pneumatomphalos,' to signify a flatulent umbilical hernia; and, what is still closer, we have 'pneumato-*cele*.'"

instance, the importance of not trusting either to percussion or to the stethoscope separately. You see that a case may occur, in which the combined use of percussion and auscultation is necessary. If you merely *strike* the chest, in these instances, you find nothing the matter; for it gives a fine hollow sound;—perhaps a clearer sound than in health. Again, if you only *listen* to the chest, without striking—if you merely apply the stethoscope, you will say, "Here is a lung solidified;" or,—"Here is a pleura filled with liquid,—with pus, or with serum." But by using both, you see clearly the nature of the case. You ascertain, by the fine hollow sound, that air is there; but by the want of respiratory murmur, you perceive that the air has nothing to do with the lungs.

You will recollect, that when I spoke of a collection of liquid in the pleura, I mentioned that, however large the collection might be, you would still hear respiration about three fingers' breadth from such side of the spine;—that the roots of the lungs were never so compressed, but that you might hear respiration there; although, in extreme inflammation of the lung, the lung becomes so solid, that no respiration can be heard. Now it is exactly the same when the pleura becomes distended with air. When the lung is compressed by air in the pleura, still the compression is never so great, that respiration cannot be heard at the roots of the lungs;—at least, it must be an extremely rare occurrence. The lung still resists sufficiently to maintain its function at the roots; and consequently, at the sides of the spine, you may hear the respiratory murmur.

There is one case in which the auscultatory phenomena resemble those which are noticed in pneumato-thorax; and that is one that I have already mentioned, under the head of chronic bronchitis. It is when the air-cells are greatly distended, and perhaps broken one into another. When the disease improperly called "emphysema of the lungs" takes place, there is a great cavity in the lungs, filled with air. I say "improperly" so called; because "emphysema" is the existence of air in the cellular membrane; and in this case it is contained in the air-cells of the lungs. You will recollect I mentioned, that there is a very clear sound on percussion; but that on listening to the respiratory murmur, you scarcely hear any thing. The cases, you perceive, are very similar in their nature; that is, cases where air exists in the pleura; and cases where some of the air-cells are very much enlarged, and partly broken down; so that a body of air exists in the substance of the lungs, and is nearly stagnant;—does not pass and repass as it ought to do in respiration. There is, however, a mode of distinguishing between the two cases; and it is this. When air exists in the pleura, you hear no respiratory murmur at all at the front of the chest;—it is stagnant; but in the case of dilatation of the air-cells, the air, although *nearly* stagnant, is never *quite* so;—it is partially expired and inspired; and therefore you do hear a faint respiratory murmur. Another mode of making the diagnosis is this. When the case is one of dilatation of the air-cells, it is consequent upon a long-continued catarrh, or

bronchitic affection. It only takes place, when a disease has existed a long time; and you hear the mucous, sonorous, and sibilious rattles of bronchitis; so that you may very clearly altogether make out the nature of the case; whereas when air exists in the pleura, it is, for the most part, a very sudden affection. There are no signs of bronchitis; and it is not only sudden, but generally very violent; and usually confines the patient to his bed.

HYDRO-PNEUMATO-THORAX.

A compound case sometimes happens;—one made up of the two affections of which I have last spoken;—of "*hydro*-thorax," or empyema, from the fluid existing in the pleura; and of "*pneumato*-thorax," in which air exists in the pleura. We sometimes see patients with both air and fluid in the cavity of the pleura. This affection is termed *hydro-pneumato-thorax*. It is a long word, but very expressive. It shews you, at once, the nature of the case;—"*hydro*-thorax," the name for *liquid* in the chest; and "*pneumato*-thorax," the name for *air* in the chest. There is nothing puzzling in the name.

If you reflect a moment, you may, as in many other cases of affection of the chest, say before-hand what will be the symptoms of this disease perceptible by the ear. The *air*, of course, must be at the *upper* part of the chest,—unless there be adhesions there; and the *liquid* will be at the *lower*; and therefore, on percussion at the *superior* part, you have a *clearer* sound than natural; but when you strike at the *inferior* part, there is a *dead* sound. The contrast is very great indeed. The sound *above* is *clearer* than usual; whereas the sound *below* is perfectly *dead*. If you listen with the stethoscope, during respiration, to all parts of the side of the chest, you hear no respiratory murmur. The air above, and the liquid below, impede respiration; and therefore there is no respiratory murmur, either in the one situation or the other. But there is this difference between simple *hydro*-thorax, and *pneumato*-thorax;—in the former case there is a *dead* sound from the presence of the *liquid*; while in the latter there is a *clearer* sound than natural, from the presence of the *air*; and in a compound case there is a *dead* sound *below*, and a *clear* sound *above*. Again. You are aware that, if you alter the position of the patient, you alter the situation of these phenomena. If the patient under examination be sitting or standing upright, the symptoms will be what I have stated. But suppose you make him lie down. You will then find that the *hollow* sound, instead of being at the *superior* part of the chest, will be altogether at the *anterior*; and the *dead* sound on percussion will be quite by the *side*;—just as you alter the relative position of the air and the fluid.

There is, however, another circumstance which takes place only in this disease;—as, I think, you might imagine. It is, that if you suddenly shake the patient,—take him by the shoulder and jolt him, you frequently hear fluctuation. You cannot hear fluctuation in emphysema alone; neither can you hear it in hydrothorax; nor is

it audible where only air exists in the chest. It is only perceptible in hydro-pneumato-thorax. You may hear the fluctuation with the naked ear applied to the chest; or by means of the stethoscope. It is well, in all cases of this sort, to put the ear on the patient's chest, and let some one move him rather suddenly ; and then you will hear fluctuation within, and the patient will be aware of it himself. Sometimes the patient has discovered this, before the medical attendant has thought of the nature of the case. You will find in one of the volumes of the "Dublin Transactions," a very remarkable case, which occurred before Laennec's time. The patient did not say, like the woman in Scripture, that he had spent all his substance on physicians; but he had been to all the doctors within his reach; and, moreover, he had been sent to the Continent; but it was all in vain. Nobody knew the nature of his malady; and he discovered it at last himself. He found that when he was sitting up, or jolted himself in any way, he heard fluctuation within his chest. He pointed the attention of his medical attendant to it; and then the latter, for the first time, listened to his chest. This phenomenon is mentioned by Hippocrates, or in some of the works ascribed to him; but, unfortunately, it is there said that it takes place only when pus exists in the chest. This is incorrect. It takes place only when there is both liquid and air in the chest; the reason of which is very evident. Those who attended to what Hippocrates, or the writer of this passage said, endeavoured to verify it by dissections; but they found that the observation was inaccurate, and therefore it dropped to the ground; and medical men neglected to apply the ear to the chest, (although Hippocrates had done so), and stigmatized the plan as mere nonsense. Unfortunately the observation was not sufficiently minute. The sound was ascribed solely to the existence of pus; and so the mistake was made.

There is another symptom (for which you would not be prepared) which exists when there are these compound contents (air and liquid) in the pleura; and that is "*metallic tinkling.*" It is exactly like the sound which, according to Laennec's description, is made by striking a pin against a piece of glass. It is a clear, silvery, ringing sound; —a sort of *metallic* sound, as is implied in the expression "*metallic* tinkling,"—a very melodious sound. It was long after I began to study the auricular symptoms of diseases of the chest, before I heard this; and till I did hear it, I mistook many a one for it. There is a click in some diseases of the chest, which, for a long time, I mistook for it; and which all people will do when they are first studying it. When, however, I once heard the real sound, the difference was so great, that it prevented my running any risk of mistaking it again. You will hear a click, but it is not fine and silvery; while in the real "metallic tinkling," the sound is very much like that which is made by wetting the finger, and rubbing it upon a glass vessel. It is not so loud; but it is a fine, clear, expansive sound.

This sound may be heard, most frequently, by putting your ear to the patient's chest, and then suddenly raising him, or causing him

to be raised upright. It is supposed that a portion of pus then drops from the upper part of the chest, down into the lower part; and thus produces the sound. At any rate, the way I have stated is one of the best modes of hearing it. You may hear it by this means, when you cannot hear it in any other mode; but in one particular case of air existing in the pleura, you will hear it when the patient is speaking, coughing, or even breathing; and that case is where the air has got into the pleura through the lungs. It appears that air, as I shall presently mention, may sometimes be secreted in the pleura; sometimes it is the result of a decomposition of puriform fluid; and sometimes it enters the pleura through a rupture of the surface of the lung. If a communication be established between the lung and the pleura,—whether by the ulceration of a tubercle, by rupture, by gangrene of the surface of the lung, or by a wound,—then you will have this clear silvery sound when the patient is speaking; —perhaps when he is coughing, or when he is breathing. An aperture of this description, most frequently takes place from an abscess of the lung;—from a tubercle bursting; so that both air and pus are effused into the cavity together; and in this case there is always a clear "metallic tinkling." I believe I mentioned that, in a patient whose case I formerly detailed, there was a most beautiful metallic sound. On striking the chest when I first saw him, I found a perfectly dead sound all over the lower part of the chest: and being told that it was a case of consumption, of course I did not know the reason of it. But on listening above, I found no respiratory murmur; and the nature of the case, in my estimation, was then clear. When he spoke, there was a fine, clear, ringing sound all over the chest; and when he coughed, it was exactly the same. After a time, it entirely disappeared; and then, I presume, a small cavity which had existed in the lung,—forming a communication between the lung and the pleura,—had healed. In about a fortnight, there was no ringing sound to be heard; and the patient, after going into the country, was apparently a great deal better. After a time, when I saw him again, there was still no respiration to be heard over nearly the whole of the chest; and there was a dead sound on percussion;— not merely at the *inferior*, but also at the *superior* part of the thorax. There was no more metallic tinkling; and it was clear that what had been filled with *air*, was now filled with a *liquid*. An operation was performed; and a quantity of liquid was let out, day after day, till it amounted to many quarts,—*gallons*, I believe. I forget how much was evacuated; but it was an immense quantity. Unfortunately, however, there was too much disease of another kind for the operation to cure him.

When air exists in the pleura, in consequence of such an opening as I have now described, before the silvery sound is heard, you will occasionally hear a particular sound, from air going in and out of the opening; and it is so much like the sound which you make when blowing air into a bottle, that it has been called "*amphoric buzzing*." I do not recollect ever having heard it.

I just now mentioned, that when the air-cells are dilated, and a cavity in the lungs exists, filled with air, the symptoms in some measure resemble those arising from air existing in the pleura; because the one is a great cavity, and so is the other. Now if it so happen that a great cavity exists in the *lung*, filled half by pus and half by air, the circumstance is very much the same, as when the occurrence takes place in the *pleura*. Just as a cavity in a large dilated air-cell, resembles a cavity in the pleura, and gives rise to nearly the same symptoms, so a large *abscess* in the lung, filled half with air and half with fluid, resembles the pleura when in the same condition; and you will therefore have the same phenomena;—that is to say, "metallic tinkling." If the symptoms take place from a large abscess (containing both air and fluid) existing in the lungs, on raising the patient suddenly, a drop will descend from the upper to the lower part, and cause a silvery sound. But if the case be not very clear, it can be made out from this circumstance;—that, when a cavity exists in the *lungs*, you will have pectoriloquy, or the air going through the tube, as if the person's mouth were at the other end of the stethoscope; whereas, in cases where the *pleura* is affected, as there is no great communication between that and the bronchial tubes, you do not have this phenomenon. Where an abscess in the lung, containing partly air and partly fluid, is large, it will give you a sense of fluctuation, upon suddenly shaking the patient.

With respect to the *cause* of pneumato-thorax, far more frequently than not, it takes place suddenly; and I believe that, more frequently than not, it happens to phthisical patients; in whom, unfortunately, a tubercle has existed close to the surface of the lung; and nature has not formed an adhesion of the surface of the lung to the costal pleura; so that ulceration has gone on to the pulmonary pleura, which has become thin, and at last has ulcerated through. It has frequently happened, that when a patient labouring under phthisis has made a violent effort, rupture has taken place. The general symptoms are extreme dyspnœa; and a person who does not use his ear, might perhaps be led to suppose, that it was merely an attack of inflammation;—especially if the patient had been running out of doors in the evening. One might then suppose, that the patient had caught a violent cold; and he might be bled and blistered all to no purpose;—the nature of the case simply being, that air had escaped into the pleura. The importance of listening to the chest, in such a case, is evident; for you may make out the nature of the case, clearly enough, by striking the chest. You find a perfectly clear sound; and yet, on listening to the respiration, you hear no respiratory murmur.

In such circumstances, an operation should be performed. The parts should be punctured, and the air let out. You will find, in one of the medical journals, an interesting case of this description, which occurred to Dr. James Johnson. It happened to a medical practitioner, who ran to a case of midwifery; and was seized with difficulty of breathing, and the symptoms I have just mentioned.

Several practitioners were called in; one of whom said that he had had a similar case the preceding winter, and that the patient was cured with hyoscyamus; but nobody had the least idea of the true nature of the affection, except Dr. James Johnson; and he was so satisfied respecting it, that Mr. Guthrie, I think, at his request, made an opening into the chest; and out came a rush of air, and the patient felt immediate relief. This was a great object effected; —at least, all those who have been in pain, know what a blessing it is to get half an hour's ease. The patient died afterwards, because he was phthisical; but had there been no other disease than this accidental escape of air, no doubt he would have done well. If the collection of air occur on the left side of the chest, it will push the heart to the right side;—just the same as a collection of *liquid*. Of course the operation would not be required, merely because you hear air in the chest. It need only be performed where there is such difficulty of breathing, as to make it necessary to do something for the relief of the patient. So in a compound case,—one of hydro-pneumato-thorax, where there is both air and water in the chest,— no operation would be required, unless there were extreme dyspnœa. It is best to make the opening large enough to let out the liquid; so that, after the air has escaped, the liquid may also be evacuated.

The general treatment would be that of phthisis, or a large abscess;—supporting the strength, &c. These are rare cases comparatively, but it is very necessary to know them. Every now and then, in practice, you will meet with such a case; and if you know the nature of it, although you may not be able to *cure* the patient, you may yet do him great good. You may lesson his sufferings; and sometimes you may even cure him. When air exists in the pleura from gangrene of the lung at that spot, and the separation of the eschar,—a circumstance which will occur when the gangrene is quite partial,—the operation, in such a case, might be followed by complete success. If air were disengaged merely from a quantity of fœtid pus underneth, it is possible that the operation might be the means of saving the patient's life,—by putting an end to the dyspnœa, which would perhaps have killed him, and then the other disease may be made to subside. Phthisis is rarely cured; but these other affections sometimes are. It may happen, therefore,—unless the patient have phthisis,—that the disease may be permanently cured.

TUBERCULAR DISEASE OF THE PLEURA.

There are certain other diseases of the pleura, of an *organic* nature; upon which I will not dwell long. Occasionally the pleura is attacked by the same disease, which forms phthisis when it exists in the lungs. The pleura is sometimes, though not very frequently, in a state of tubercular deposit. Sometimes, in phthisis, you will see one pleura, or both, beset with tubercles of various sizes;—generally small, but sometimes of a large size.

The deposition of tubercles in the pleura, may be attended with scarcely any symptoms whatever; because phthisis may exist at the

same time, and the symptoms of the *greater* disease, may swallow up those of the *small* one. But sometimes, if the disease exist alone, and is of any considerable amount, there will be all the signs of a pleuritic effusion into the chest;—all those symptoms which I just now mentioned; and it may not be easy to make a diagnosis, in a case of this description. One is continually surprised, on making a post-mortem examination, to find tubercles in the pleura. But if the disease be considerable in any one spot, you will have marks of pleuritis. Inflammation will take place around the tubercle; and suppuration will occur. But it is not easy to distinguish inflammation from such a source as that, from inflammation of a simple nature. When suppuration takes place, pus may be discharged into the pleura; or, without suppuration, there may be an effusion into that cavity from excessive secretion; and the secretion may be either serous or purulent. In fact, you may have pleuritis, and all the *consequences* of pleuritis; so that you may have air pass in, and all those other changes will take place which I mentioned as occurring without tubercles; and the patient will become hectic.

The treatment of the case will depend entirely upon the presence of air, the presence of liquid, the presence of inflammation, and so on. It is only necessary to know, that all the changes which I have now mentioned, are sometimes connected with tubercles in the pleura itself; and that sometimes very minute tubercles will exist there, and give rise to scarcely any symptoms at all. Tubercles are frequently observed there, when they are seen in various other parts of the body. More frequently than not, perhaps, when pleuritis is chronic,—when the patient has a fixed pain of an inflammatory nature, in the pleura, and wastes away, it is a scrofulous affection; and is attended by this tubercular deposition. The tubercles, most probably, are situated in the cellular texture, immediately under the serous membrane.

OSSIFICATION OF THE PLEURA.

I have seen the pleura ossified to a great extent. Here, again, it is not the *pleura*, properly speaking, that is ossified.—at least *originally*; but it is the cellular membrane under it. The cellular membrane is frequently converted into bone, in various parts of the body; or bony deposit takes place in the cellular membrane. Perhaps the latter is a more accurate mode of speaking. But the pleura above the bone will sometimes disappear,—waste away; so that on looking into the cavity of the pleura, you perceive the bare bone. I recollect once meeting with this occurrence, to a great extent, in an old man who died of ascites and liver-disease; and who was not aware that he had disease in the pleura;—at least, he never attracted our attention to it. I recollect remarking how well he could lie down, notwithstanding the fluid in his abdomen. I found the pleura covering several ribs in a state of ossification.

Other affections may occur in this situation. You may have

scirrhus, and melanoid disease; but these are comparatively rare affections.*

PERICARDITIS.

The subjects to which I now pass, will be inflammation and organic diseases of the other serous membrane contained in the chest;— inflammation of the pericardium.

In speaking of inflammation of the pericardium, I will consider that membrane both in its loose portion, and that which is bound closely down to the substance of the heart. I believe some writers call inflammation of that portion of the pericardium which closely invests the heart, *carditis*, as well as inflammation of the heart itself; but as it is all one continuous membrane,—the loose portion and that which is bound down,—and both adhere together, it is more correct to speak of inflammation of *both* portions under the term of "*pericarditis*," than to call *one* "inflammation of the pericardium," and the *other* "carditis."

Formerly this was not supposed to be a common disease; but so far from that opinion being correct, it is an exceedingly common affection. No man in practice can pass a month, without seeing cases of this description. This disease has been thought to be one not very easily made out; and, like all other diseases, I suppose that sometimes it may escape the attention of good practitioners; and that they may have been surprised, after death, to find signs of inflammation within the pericardium.

The symptoms of the disease, are pain in the region of the heart; and that pain is frequently increased upon pressure;—provided you make the pressure between the ribs over the heart, so that it actually influences the pericardium. If you make an exceedingly great pressure upon the ribs themselves, so as to press them down as much as possible, you frequently increase the pain; and you also have an increase of pain, if you push up the ends of the fingers under the cartilages of the ribs, so as to drive the diaphragm against the heart, with the ends of the fingers. Then the pain,—that which is felt at all times, and not that which you occasion merely by pressure,—generally darts up to the left shoulder. It also goes through to the back; and very frequently it extends down the left arm. From these symptoms, and the increased action of the heart, together with the pyrexia which is present, I think any one would be justified in saying there was pericarditis; and if he treat it accordingly, he wil generally find himself treating the patient right.

* We cannot take leave of Diseases of the Lungs, without directing the attention of our readers to "A Treatise on the Diagnosis and Treatment of Diseases of the Chest. By William Stokes, M.D." In this, the most able work we possess on the subject, one of the first stethoscopists of the day has given us the result of great talents and ample opportunities, brought to bear, for a long series of years, on this, his favourite department of medical investigation. The expectations of his friends could not have been higher than they were; and Dr. Stokes has not disappointed them.

The use of the ear in this disease, so far as I have been able to notice, is rather negative than positive. I have not been able, very frequently, to hear any thing unusual about the sounds or action of the heart; except that the heart acts too violently. In these cases there is palpitation; but on listening you will hear nothing more, than that the heart throughout is beating strongly; and perhaps all the sounds are a little increased; but not more than will occur, if you make the heart beat violently from exercise, or from taking any stimulant. Now and then it will happen, that the action of the heart takes place with a blowing sound; but that by no means occurs invariably. Much more frequently than otherwise, there is no such thing; and when it does take place, it generally continues; and the case becomes more or less chronic. It is not a necessary circumstance that it should take place; and it does not deserve, in my opinion, to be considered one of the symptoms in the disease. So frequently is this sound absent,—so frequently will it arise from other causes than pericarditis,—that if the case be one of pure pericarditis, I do not believe this sound will take place. I believe it occurs only when some other affection is present at the same time.

This disease is both acute and chronic;—like most other inflammations; but when it occurs in an acute form, far more frequently than not, it accompanies, or has been preceded by rheumatism; and it is a disease which occurs far more commonly in young persons,—in youths and young adults, than in any others. You will occasionally see it in infants, *in*, or *after* rheumatism; but, generally speaking, it attacks children from twelve to fifteen years of age perhaps; and young adults up to thirty. I do not recollect an instance of its occurring from the *suppression* of rheumatism. In every case that I can recollect, at this moment, it has occurred either *during* an attack of acute rheumatism, or some time *afterwards*; and not when the rheumatism has suddenly disappeared, but when it has gone slowly away; or when there has been some little degree of it still lingering in the body. I have seen rheumatism cease suddenly, without seeing this disease as the consequence of it, and every other practitioner must have seen the same. Far more frequently than not, it occurs as a part of rheumatism; but it does not arise from the sudden cessation of that complaint in the joints. It is a curious circumstance, that sometimes after the rheumatism has ceased for three or four months, when the patient has got rid of his rheumatism entirely, a pain has come on in the side;—and signs of pericarditis, greater or smaller, have taken place. The French say that they consider this as the result of suppressed rheumatism in the joints; but I have never seen it. I have been in the habit of applying cold water to joints affected with rheumatism, when they were hotter than they should be; but I have never seen this result. It will sometimes occur from cold and wet, like any other inflammation; but generally that which will produce it, produces at the same time rheumatism of the joints.

I believe it is entirely an English discovery, that this disease is so

connected with rheumatism. The observation was made cursorily at first. It was merely supposed that disease of the *heart* was connected with rheumatism. For that observation we are indebted to Dr. Pitcairn, of St. Bartholomew's hospital; but he was a diffident man, and could not be persuaded to publish it. Neither Dr. Baillie, nor any one else, could prevail upon him to make it known through the press; but he was the first person who pointed out the fact, that disease of the heart was continually connected with rheumatism. Sir David Dundas, a surgeon at Richmond, subsequently published a paper on the subject, in the first volume of the "Medico-Chirurgical Transactions;" but this was many years after Dr. Baillie stated the fact, in his "Morbid Anatomy;" and ascribed the discovery of it to Dr. Pitcairn. Sir David Dundas, however, never makes an allusion to this; but brings it all forward with an air of novelty, and publishes it as an original discovery.

However, I think it is pretty certain that disease of the *heart* is not connected with rheumatism, except so far as the effect of *pericarditis* is connected with rheumatism. We every day see the latter occurrence; and whenever you see a case of disease of the heart connected with rheumatism in a young person, and the patient dies, you will find marks of preceding inflammation within the pericardium; and if you inquire into the history of the case, you will find that there were originally symptoms of pericarditis. I am quite clear that the rheumatism is connected with the inflammation of the pericardium. I will not say it *produces* it, because all the symptoms result, perhaps, from the same state of the system; but the first thing *connected* with the rheumatism, is pericarditis; and then when that has existed any considerable time, the organic changes of the heart take place. You may easily, I think, satisfy yourself of this, by reading all the cases that have been published of diseases of the heart, as consequent upon rheumatism. You will find strong proofs of inflammation of the pericardium; and if the original history of the case be detailed, you will see strong symptoms of pericarditis. If you attend to this matter, when you inspect the body of a person who has died of the disease, you will find marks of pericarditis; or if you make inquiry of a patient, you will find the symptoms are those indicative of the complaint; and every day, when you see cases at the onset of affection of the heart connected with rheumatism, you will see that inflammation has taken place first, and that organic disease is consequent upon that. This is a very happy circumstance; because inflammation of the pericardium may be controlled, as easily as inflammation of any other part; whereas organic disease of the heart, for the most part, is an affection which we can only palliate. But it is not disease of the *heart* which is connected primarily with rheumatism, but *pericarditis*. This is nothing more than you would suppose; because young persons, who are chiefly the subjects of this disease of the heart, are not subject to organic diseases, except scrofula. They are subject enough to *inflammation*; and we know that inflammation of any part whatever, will leave organic

disease. The great source of organic disease, is inflammation; and it is quite capable of producing every organic affection whatever;—that is to say, of producing all *common*, and all *structural* diseases, and a predisposition to any *peculiar* disease. The debility produced by inflammation of another part, easily makes the patient the prey of a specific affection. But it is in *young* subjects that this affection occurs;—in young subjects who are particularly liable to *inflammation* of every description; and not to *organic* diseases of any kind, except scrofula.

After death from this disease, the anatomical appearances are just the same, as after inflammation of any other serous membrane. There is sometimes redness in stars; and sometimes there are patches of redness. The redness seldom extends very deep, even in the most violent cases. The membrane does not become thickened; but of course a quantity of fibrin is seen lying upon it, and a quantity of serum is collected within the cavity. The fibrin is generally in very fine layers;—it forms layers upon the pericardium; and sometimes it lies in a mass, like jelly. It is usually irregular upon its surface, having minute pores; and sometimes these pores,—these little irregularities, are very considerable; so that Laennec compares their appearance to that of two slabs, which have had butter spread upon them, and have then been forcibly separated. A number of knobs then appear; with, of course, little excavations between them. There is often a great deal of this exudation, when the redness is very considerable.

If these exudations are considerable, they will sometimes glue the two portions of the pericardium together; so that they cohere to the heart; a cavity no longer exists; and hydrops pericardii cannot take place. Such cases have been taken as instances of the entire absence of the pericardium. There are, perhaps, half a dozen cases on record, where no pericardium existed; but there is no question now, that the cases so described are altogether doubtful. They were nothing more than instances of the cohesion of the two portions of the pericardium;—the loose portion, and that which immediately invests the heart; so that a mistake has been committed. You find, in one of these instances, that there had been a complete cohesion; but occasionally the adhesion is partial,—exists here and there. Of course there is a very great variety as to the strength of these adhesions. Sometimes they are very slight, like those in the pleura; and sometimes they are very tough and fleshy;—indeed, almost cartilaginous. With regard to the quantity of fluid which is produced from the inflammation, it is seldom very considerable. Now and then it is; but that is a rare occurrence. For the most part, this fluid presents the same appearance as in other inflamed serous membranes. Sometimes it is turbid, of a yellow colour, and containing a few flakes of lymph; but now and then, as in the case of the pleura, it has the appearance of pus; and even absolute pus has been found in large quantity; and that within the pericardium. Dr. Baillie says, that he once saw a quart of pus in the pericardium; and no ulceration

existed. It was pus secreted by a *serous* membrane;—exactly as you frequently see it secreted by a *mucous* membrane.

As to the *treatment* of the disease, when it is acute there is nothing peculiar in it; and I will not take up your time for a moment in speaking of it. The treatment is the same as that for active inflammation in any other part of the body; only it is to be remembered, that this inflammation is seldom violently active. It is generally moderate inflammation; and disposed to become chronic. When acute inflammation is not very intense, the best way of attempting to remedy it, is by local bleeding; and a very moderate inflammation of the pericardium,—just like a moderate inflammation of the pleura or the peritoneum,—is best treated in that way. I think, in my own practice, I have noticed that pericarditis yields more readily to free *local*, than to *general* bleeding; and I believe this is owing to the general principle that inflammation, when (although acute) it is not very intense, is best remedied by local means.

Inflammation of the pericardium, when acute, is seldom of a very active character;—not so active as pleuritis or peritonitis; and it is disposed to fall into the chronic form. I believe the greater number of persons who have pericarditis, do not die of it immediately; but at a remote period; and then death arises from *acute* inflammation, degenerating into the *chronic* form. This is the principal danger arising from pericarditis. Mercury should be given; rest should be enjoined; and the patient should be restricted to low diet. These are the only observations that I think it necessary to make respecting this affection. Nothing more can be said than what I have advanced, over and over again, respecting the treatment of inflammation in general.

As to the *chronic* form of the disease, the symptoms are precisely the same as when the affection is *acute*; only not so violent. But in the chronic disease there are generally other symptoms, which depend altogether upon structural disease of the heart. Whenever pericarditis has become chronic, there is the greatest probability that more or less organic structural disease of the heart has taken place; and you seldom meet with a case of chronic pericarditis without observing, after death, that the valves are diseased, or that the substance of the heart is so. If those adhesions of which I have spoken take place, there may be great inconvenience, or there may be none at all. I have frequently seen the two portions of the pericardium completely coherent, without any symptoms being produced. Indeed, I never recollect seeing a symptom that was at all referrible to this state; and I do no believe that any inconvenience arises from it; though I have seen great inconvenience arise from *partial* adhesions. The heart appears to act just as well as when it is properly enveloped with the pericardium,—as when it is in a natural state. When symptoms have manifested themselves, there has been sufficient disease of another kind to explain them, without the pericarditis. But a case of a female who had disease of the heart, came before my notice; and it was a singular fact, that whenever she lay on her back, she was in

extreme agony. She was easier even on her left side than on her back. In diseases of the heart, you generally find that patients lie more easily on the *right* side than on the *left*; and the reason is evident;—it is because the heart is very near to the ribs; and when the patient lies on the left side, there is a considerable thump against them. But this woman, although she could lie better on the right side than the left, could lie better on the left than on the back. A pain was experienced about the sternum; and she could not lie in that position. On opening the body, a strong adhesion of the pericardium was found; so that a portion of the heart was suspended; and every time she lay on her back, the heart endeavoured to drag towards the spine; but that being prevented, there was a constant stretching of the parts. I know an instance now, where the patient (a female) appears to have chronic pericarditis; and cannot lie at all on the side, without experiencing a darting, stabbing, pulling sensation on the opposite side. I have no doubt, from the symptoms, that there is an adhesion, in this case, of the side of the heart. I fancied that, in the other case, there was an adhesion in front; and, in my work on Diseases of the Heart, I have given a representation of it.*

You will find, in many books, an account of the signs of adhesion of the pericardium; and almost every day I see patients, who are labouring under various affections of the heart; who have been told that it was an adhesion;—just as people will come with a pain of the side, and have all sorts of fanciful notions, which have been spread abroad by persons who do not dissect cases after death. I am quite satisfied that if medical men would adopt that practice, they would find (as I have) a large number of cases, where there has been com-

* "Recent Improvements in the Art of Distinguishing the various Diseases of the Heart;—being the Lumleyan Lectures, delivered before the Royal College of Physicians, in the year 1829. By John Elliotson, M.D. F.R.S." The representation of the case referred to in the text, occupies the third and fourth Plates; and the following notes are added:—"The patient (a young woman) invariably complained of a dragging smarting pain, at the front of the chest, in the supine position. There was violent impulse of the *left ventricle*, with irregularity in force and frequency; a bellows-sound in the region of the *left auricle*, between the pulses; a bellows-sound in the region of the *right ventricle*, synchronous with the pulse; and a clear sound in the region of the *right auricle*, between the pulses. Dyspnœa and anasarca were present; and the *right auricle* (which is partly seen in Plate IV.) was greatly dilated." In the body of the work (at page 11) the following observations occur in reference to the pain felt in this case:—"I have seen the whole pericardium so coherent, that its cavity was entirely abolished; and yet the symptoms which had been present, were exactly commensurate with the *organic disease of the heart*, which existed at the time; and had certainly no relation to the *adhesion of the pericardium*. I cannot say I ever observed a symptom produced by adhesion of this part, except in *one case*; and there a single thick adhesion extended along the front of the heart. In the supine posture, this must have been dragged down by the subjacent heart; and must have tended to drag the pericardium of the front of the chest with it, and to suspend the heart; so that the parietal and cardiac pericardium, at their points of union with it, must have been put upon the stretch. The patient, accordingly, had been unable to lie on her back; on account of a smarting pain, produced in this posture, at the front of the cardiac region."

plete cohesion; and yet where there was no reason whatever to ascribe any of the symptoms that did occur, to those adhesions. It is evident that when an adhesion of the heart is great, it must impede the heart's action; but even then, I do not believe it will give rise to palpitation. When persons come with nervous or dyspeptic palpitation, they will tell you they have been informed there is an adhesion of the heart, and that nothing can be done for them. The fact is, medical men entertained that opinion, a generation or two ago; but it has since been abandoned. The common people, however, still retain the notion, as they usually do the opinions of their superiors, long after the latter have cast them off.

With regard to *effusion* into the pericardium, it is a very rare thing for that to amount to such a quantity as to produce inconvenience; but still such a circumstance may occur. The mode of discovering this occurrence, would be by finding that, on striking around the region of the heart, there was a dull sound to a very great extent; and yet no signs of disease of the heart itself;—no preternatural sound, as if the valves were diseased;—no unusual thumping of the heart;—no unusual *loudness* of the heart; and, on the other hand, no *diminished* sound of the heart;—nothing occurring perhaps, but a dulness of sound, to a very great extent, about the region of the heart. I never saw such a case; but those are the symptoms which, from the nature of the case, you might predict; and you find them mentioned by Andral, as occurring in the cases which took place in his practice. In all probability, there has sometimes been a swelling of the feet, a deficiency of urine,—the common symptoms of dropsy,—and more or less dyspnœa. When such an occurrence takes place, you may *suspect* the existence of this affection; but I do not know that you can be *sure* of it. You must treat the case according to your suspicions.

If there be no signs of inflammation left, it will be proper to give diuretics vigorously. But we have cases on record where, in these circumstances, the pericardium has been opened. Of course this would be improper, unless a person appeared to be dying. Unless a patient appeared to be dying from a difficulty of breathing, and fluctuation were felt, I do not think that any person would be justified in opening the pericardium,—whatever might be the other symptoms. You will find it said that, when a soft fluctuating tumor has been felt about the region of the heart, the operation has been performed with success; but I can give you no farther information on the subject. I should like a long consultation, before I recommended the pericardium to be opened.

TRANSFORMATION OF THE PERICARDIUM.

The chronic form of pericarditis is frequently followed by the other changes of inflammation;—by the various transformations which I formerly mentioned. Frequently, the cellular membrane under the pericardium is transformed into cartilage; so that you have knobs of cartilage here and there; and sometimes you have the transforma-

tion that I spoke of subsequently to cartilaginous transformations; namely, that of bone. It is common for the sub-serous cellular membrane to become cartilaginous; and sometimes it will proceed farther, and you have bone. I have seen the heart, in some instances, almost encased with bone. When the heart is said to be converted into bone, I imagine the nature of the case to be this; The sub-serous cellular membrane has been ossified; and the muscular substance has wasted away. It is a common thing, in various structures, when one portion becomes very hard, even to the extent of ossification,—it is very common for the other constituents of the structure to waste; and that, I imagine, is the case in instances of "ossification of the heart," as they have been called.

NEW FORMATIONS IN THE PERICARDIUM.

The pericardium is rarely subject to new formations; but sometimes scrofulous deposit takes place in it; sometimes hydatids have been found; and occasionally scirrhus, and the other new formations which I formerly mentioned.

HÆMORRHAGE INTO THE PERICARDIUM.

I believe, when speaking of hæmorrhage, I mentioned that the pericardium is a part where it takes place suddenly, without a rupture of the vessels. You will find, in Dr. Baillie's work, an instance or two of this description. I saw the parts after death, in a case of this kind; and nothing could be discovered as giving rise to this hæmorrhage. The parts were soft, and that was all. I have mentioned the occurrence of cases of this kind in the stomach, intestines, and spinal canal; but it will take place in various parts of the body, without any obvious mechanical reason; and it has sometimes occurred among others, in the pericardium.*

DISEASE OF THE LINING MEMBRANE OF THE HEART.

I shall now proceed to speak of what may be called the membrane corresponding to the pericardium—the membrane within the heart. You know that the heart has a membrane within, as well as a membrane without;—a membrane which is continuous with the lining membrane of the aorta, and of the valves. This is subject to inflammation,—the same as the pericardium is; but there are no signs by which you can ascertain its existence. You may occasionally *suspect* it; but after all, I imagine it will be a mere guess.

After death, however, this lining membrane is certainly found occasionally in a state of inflammation; but you are not to presume, in every instance in which you find redness of this part, that there is inflammation. If it so happen that the parts are all soft, they will become dyed by the blood,—they will imbibe it after death; and the blood which is in the cavity will stain them. Almost always when

* For some additional particulars respecting diseases of the pericardium, see Appendix, No. VII.

you find the heart softened in structure, you will observe it of a deep red colour;—simply as the effect of that imbibition, which I mentioned, when speaking of inflammation in general; and when I pointed out the necessity of being careful, in many instances, not to decide that there was *inflammation*, simply because there was *redness*. In the case of softness of the heart, you will continually find the lining membrane of the valves and other parts intensely red, without there having been inflammation; but there is no doubt that this redness does sometimes result from inflammation. This is proved by finding fibrin effused upon the coloured portion, and adhering to it closely. Another proof is, that you find the part which is so intensely red without a drop of blood in contact with it. You will sometimes find the membrane red in particular valves, for example; and yet the whole cavity will be emptied of blood; so that it cannot be ascribed to the imbibition of blood from the part with which it was lying in contact. Occasionally this redness will arise from great dyspnœa. You are aware that when, before death, there is long-continued difficulty of breathing, the mucous membrane of the stomach, intestines, and bronchia, becomes very red; and the right side of the heart becomes gorged with blood. In these cases you will, in many instances, have redness of the inner membrane. But where a patient has died suddenly, and there has not been time for the gradual accumulation of the blood from the smaller vessels,—where after death no blood is lying in contact with the red part, you sometimes find the lining membrane intensely red.

In cases of this description there has sometimes been before death, great rapidity of the pulse, rapid action of the heart, and more or less uneasiness and smarting in the region of the heart. If this occur within the aorta, for example, there is in general great rapidity of pulse, and a smarting sensation down the spine in the course of the aorta. In the case of the heart, the only reason that you have to suppose its existence is that, in addition to the signs of pericarditis (for pericarditis is generally united with it), there is a very violent action of the heart indeed; but I confess that, more frequently than not, I have found this appearance after death, without having had any reason to suspect it during life.

When the lining membrane is affected with inflammation, it is generally a mere *chronic* disease,—just like inflammation of the pericardium. It undergoes the common changes produced by inflammation; it becomes thicker than it should be; and, at the same time, it becomes harder. The parts of this membrane most frequently affected, are those which form the valves. The valves, you know, are nothing more than an elongation and doubling of this lining membrane. In the case of the tricuspid and mitral valves, a portion of tendinous structure likewise enters into their composition. The chordæ tendiniæ, invested as they are by the lining membrane of the heart, run along into the valves, and are lost there in the lining membrane; so that the mitral and tricuspid valves, are made up of *fibrous* membrane and the *lining* membrane;—tendinous and

serous membrane; whereas the semilunar valves of the aorta and pulmonary artery, are nothing more than the lining membrane itself, protruded and extended.

It is a general rule observed in pathology, that the lining membrane at the opening of the heart, is more subject to disease than other parts;—whether it be simple inflammation, or the effects of chronic inflammation in any other part. You know very well, that it is not the stomach at large which is generally diseased; but one of the openings;—the cardiac or the pyloric. You know that, more frequently than not, disease affects the intestines where the small intestines terminate in the large; or, again, where the large terminate in the rectum. The rectum is the great seat of scirrhus, stricture, and various other diseases of structure. In fever ulcerations are more frequently found at the termination of the ileum than elsewhere; and there it is we continually see schirrus and cancer of the intestines. Instances of disease of the cardia and pylorus, are infinitely more frequent than disease of the rest of the stomach. Exactly the same is observed in the case of the heart; so that you have infinitely more cases of disease of the *opening* of the heart, than you have in any other part of the lining membrane. This is nothing more than an exemplification of a general rule.

There is another rule, however, which is peculiar to the heart; namely, that the left side is more subject to diseases of all kinds, and infinitely more to redness, than the right. That is a general rule, with respect both to the lining membrane within the heart, and with respect to the substance of the heart itself. Various hypotheses have been formed to explain this; but the most probable explanation is, that one side of the heart receives blood of an *arterial* character, whereas the other has blood of a *venous* character. It has been thought that one side of the heart does more work than the other; but in proportion it certainly does not. Every time the left ventricle contracts, the right does the same; and so with respect to the auricles; and if the left ventricle have to send its blood farther than the right, yet the structure is much thicker than that of the right; and thus it is fully qualified for the exercise of the duty which it has to perform. No difference that I can discover exists between them; except that one receives *arterial*, and the other *venous* blood. Whether that will explain the circumstance, I do not know; but we know, as a general rule, that arteries are more subject to active diseases of all kinds, than veins; and it is very probable that the greater stimulus of the arterial blood occasions other causes of disease, when applied, to act more energetically; and also causes disease to take place with more readiness.

DISEASES OF THE VALVES OF THE HEART.

Inflammation of the pericardium, therefore, when chronic, is very frequently united with chronic inflammation of the membrane within the heart; and most frequently with chronic inflammation of those parts that form the valves. This is one way in which organic disease

of the heart is produced; namely, by pericarditis. Pericarditis seldom exists long, without being followed by a similar state of the lining membrane within. You know that, in the natural state, these valves are quite flexible; and though not *transparent*, are *translucent*; —they allow light to pass through them, although they will not allow you to see through them;—they are fine, flexible, and translucent. But when they have become chronically inflamed, instead of being light, they become yellow; and instead of being translucent, they become opaque. They lose their flexibility, perhaps; and become more or less rigid. They play less easily; and at last become quite rigid. They lose their fineness, and become thick; and not only thick, but dense. If these changes be not very severe, they give rise to no symptoms at all. If they do not prevent the passage of blood, by narrowing the opening,—if they do not prevent the valve from doing its duty, no symptom (that I am aware of) can arise; so that the best auscultator in the world may find, after death, disease of the valves, of which he had no idea before the patient ceased to live. It is only when function is impeded, that any symptom can arise.

The change which the valves undergo will, at last, amount to cartilaginous hardness. They will become perfectly cartilaginous; and, in a still further degree, they will become complete bone. When they undergo this change of consistency, the aperture of the part is diminished. In the case of the tricuspid valve, the opening may be reduced to one-third or one-fourth. Still, however, it generally retains its circular form. In the case of the corresponding valve on the opposite side,—the mitral valve, the circular form is still in many instances retained; but in other cases the opening grows up in such a way, that it is only a chink. Instead of being circular, it is of a crescent form,—a sort of semilunar chink; and from the valve growing so considerably, a pouch is formed, leading from the auricle to the ventricle; so that when you open the left ventricle you see, as it were, a pouch extending into it; and, at the end of the pouch, there may be a circular opening. Sometimes, instead of a pouch, the valve is all contracted together; and you have nothing more than a chink.

Sometimes the valves will become bony. When there is bone, it is deposited under the membrane;—it is deposited, as in all cases of serous membranes, immediately under it; and then the membrane, from the presence of the bone, becomes exceedingly thin; till at last it will disappear, perhaps, over the bony portion; and the bare bone is then in contact with the blood. It is very rare for the valve to be universally converted to bone, nor is it common for it to be universally converted into cartilage; but the changes exist in different degrees at different spots; so that here and there there will be bone, and sometimes the valves will become completely cartilaginous.

With regard to the valves between the auricles and ventricles on either side,—the *tricuspid* on the *right* side, and the *bicuspid* or *mitral* on the *left*,—when they are much diseased, instead of falling back,

they form a very considerable curtain, with an opening (generally of an oval or circular form) in the centre of it. The different parts of the valve may become filled, or grown up; so that you have a complete membrane between the auricle and the ventricle; and in the case of the *mitral* valve, especially, we every day see it extended in the form of a pouch. The opening in the mitral, as well as in the tricuspid valve, is generally in the centre, and is circular or oval. I before said that the mitral valve is sometimes so grown up, that a mere slit remains; and it is worthy of notice that this slit is not straight, but is generally of a crescent form,—in the shape of a bent finger;—the concavity of the opening usually being towards the root of the aorta, and the convexity backwards. I believe the latter circumstance may be said to be universally the case. If you look from the auricle, you see the light through the chink, in a very remarkable manner. I believe this observation was first made by Mr. Adams, a surgeon at Dublin; who wrote a very excellent paper on Diseases of the Heart, in the "Dublin Hospital Reports."*

With regard to disease of the other two openings of the ventricles,—the opening of the *right* leading into the *pulmonary artery*, and in the *left* leading into the *aorta*,—disease is more frequently found in the valves of the aorta, than in those of the pulmonary artery. This is according to the general rule, that all diseases far more frequently affect the *left* side of the heart, than the *right*. It is a rare thing, indeed, for the *pulmonary* valves to be much diseased; but if they are, the appearances are the same as when the *aortic* valves are affected. When the latter are diseased, they will stand quite firm; and do not give way at all to the common pressure of the blood; so that the opening becomes diminished. The aperture which is left in the middle of the three valves, is sometimes circular; though occasionally it is triangular. It sometimes happens that these valves are completely converted into bone. They then form three shells of bone; but still they retain the appearance they present when there is only cartilage. It is very common to find bone about the aortic valves,—more common than any where else; but next in frequency you find it on the *mitral* valve. It is sometimes found at the *edge* of the valve; sometimes at the bottom of the *sac* of the valves; and sometimes there is bone on the aorta, *opposite* the valves. The quantity of bone is sometimes very great; and occasionally you will find it in minute granules, and not very firmly adherent; so that by rubbing it with the finger, portions come off in the form of grit.

These changes are not the only ones, however, that we observe in the valves. Occasionally we find excrescences; and these are so much like venereal warts on the genitals, that Corvisart, who has written a very good work on Diseases of the Heart, actually believed they were syphilitic. The appearance of warts on the genitals, does not depend upon their being syphilitic, but upon their being morbid growths of a particular structure; and we know that, in the greater

* Volume IV.

number of cases, the warts depend upon mere irritation, without any other cause. These excrescences are very various in their appearance. Sometimes they are variously pointed, so as to exactly resemble venereal warts; and sometimes they are of a very great length. I once opened a body, in which the excrescences were so long, that they nearly reached to the apex of the heart. It was the extremest case I have ever seen. There were a number of projections from the outside of the mitral valve; but it was at the roots of the *aortic* valves that they were so very long.

When the valves become so changed in various ways, they frequently shrink, and become shallow; and they also shrink in breadth. They also frequently become shorter, so that the aperture is altogether diminished; and when bone is deposited upon them, they frequently become brittle; and from being brittle they split and crack. The two valves frequently separate at the point at which they are usually united. They are no longer bound down, and the two are thrown into one; and at that point the valves frequently split to a greater or less extent. This is a very common occurrence. The valve is so corrugated, that the division between the two is lost. This is just the same occurrence that takes place in the interior of an artery, when bone is deposited there. An aneurism arises from the deposition of bone, and not from the mere coat of the artery. Bone is deposited in the middle of an artery, and the coat splits. In the case of the heart, it is not an artery that is affected, and therefore an aneurism is not produced; but the part splits in the same way. Dr. Baillie has given an excellent representation of some of these affections.

When the aortic valves become opaque, thickened, indurated, and rugged, they sometimes corrugate,—so as to curl in towards the side of the aorta; and sometimes so as to turn out. There is nothing very wonderful in all this. Sometimes they are neither curled *in* nor *out*; but remain rugged. A paper was read at a society by a gentleman, announcing this as a very great discovery; but really it was no discovery at all. Corvisart's work* contains a mass of information on diseases of the Heart and Aorta; and is the best you can possess, next to Laennec's on Diseases of the Chest. I recollect he states (without announcing it as any thing important) that sometimes the valves are folded *in*, and that sometimes they are folded *out*. Occasionally you will find that the induration is merely at the *roots* of the valve. On rubbing each, you will find the root semicircular and hard. These are the chief varieties of disease of the valves.

With regard to ossification, although it is seen so commonly in the *aortic* valves and the *mitral* valve, it is a very rare thing indeed to find the disease advancing so far upon the *right* side of the heart; but far more rare indeed to see it proceed so far upon the valves of the *pulmonary artery*. The tricuspid valve of the right side, is far more frequently diseased, than the semilunar valves of the pulmonary

* "Essai sur les Maladies, et les Lesions Organiques du Cœur, et des Gros Vaisseaux."

artery. Thus the aortic and mitral valves are not only far more diseased than those on the right side, but (to go to the latter situation) the tricuspid valve is more frequently diseased, than the valves of the pulmonary artery.

The changes to bone and cartilage, when they occur in young persons, are undoubtedly the result, in by far the largest majority of cases, of mere accidental inflammation; so that without having rheumatism, catching cold, or being exposed to the causes of inflammation, the individual would never have suffered from the disease. But these affections, when they occur in old persons, can rarely, I believe, be traced to any particular attack of inflammation. They appear to be a degeneration of structure dependent upon age. Some parts of the body, under the influence of age, suffer transformations sooner than others; and this portion of the heart will become diseased, in old persons, really from a disposition to organic disease, and not from the result of accidental inflammation. This change of structure is common, in various parts of the body, as individuals grow older.

Although the foregoing are the parts of the lining membrane of the heart, which are most frequently diseased, yet you will occasionally see other parts of the lining membrane of the ventricles and auricles, but particularly the former, thickened very much, and hardened. Sometimes the lining membrane is particularly thickened where it lines the ventricles; while, at the valves, it is in a healthy condition. But this is an exception to the general rule. Now and then you will see a little ulceration of this membrane; but that is a very rare occurrence. I am not aware of any thing else worthy of being particularly mentioned, as to diseases of the lining membrane of the heart.

There is one little circumstance, however, which I do not find to be much dwelt upon in books; and it is, perhaps, the result of inflammation. Occasionally, after chronic pericarditis, there will be a deposition of lymph under the mitral or tricuspid valve; which will bind it completely down, so as to prevent it from fulfilling its functions. I have seen several instances of this occurrence. My attention was drawn to it by Dr. James Johnson; or probably I should not have known any thing about it. After I had published a case of this description, I found it had been incidentally mentioned, some years ago, in an account of the dissection of a body; but in the regular books on diseases of the heart, I do not recollect having been able to meet with any mention of the circumstance. You know that the tricuspid and mitral valves have a free floating curtain; and that if lymph be deposited between them and the heart, they may be bound down. A striking instance of the first of these affections, occurred to me; and I have never met but with three or four cases. I have given a representation of the case, in my work on Diseases of the Heart. One half of the valve was bound down, and the other helf remained floating. That half which was bound down, formed a continuous surface into the ventricle. This was a case of common rheumatic inflammation. The woman had had rheumatism, several

times. She had had disease of the valves; and also inflammation of the left ventricle.*

After having troubled you so long with these morbid appearances, we will consider what effect these changes must have upon the functions of the heart. The effect may be two-fold;—it may be to diminish the aperture through which the blood escapes from the auricles or from the ventricles; or it may prevent the valves from doing their duty, in offering an obstruction to the blood when it attempts to come back. Hence these changes may cause an obstruction to the blood going from the auricles to the ventricles, or from the ventricles to the pulmonary aorta; or they may prevent the valves from offering an obstruction to the blood; so that it rushes back, in some degree, from the ventricles to the auricles, or from the pulmonary artery or aorta into the ventricles. When the aperture is diminished, and the valves grow up, then there will be an obstruction to the transit of the blood; but very frequently the valves become so rugged, that they will not distend when the blood attempts to return; and therefore they can no longer perform the office of a valve. When the blood drives back against them, a portion of it goes through; though, of course, not the whole; because, whenever the valves are indurated and rugged, the aperture is diminished; and therefore at the same time that the diminution of the aperture prevents all the blood from going out that should do so, it prevents some from coming back that wishes to do so; and therefore there is not a *complete*, but a *partial* retrocession. Now the same thing will occur, if the valves happen to be bound down; but I have never seen the valve bound down, except in the case of the tricuspid; and I cannot conceive it possible that it can happen in the case of the semilunary valves of the aorta, or of the pulmonary artery; but if the aortic valves are corrugated, and are only half

* Plate III. An account of this case will be found in an extract we have given at page 791. The morbid appearances are thus summed up:—"The tricuspid valve thickened throughout; one-half grown up, and completely adherent to the inner surface of the ventricle, with a hard rounded edge; the other half loose, and put upon the stretch, to shew its extent, and the dimensions of the opening left during the play of the valve. The figure of the heart is altered,—being lengthened by hypertrophy and dilatation of the left ventricle; while the *right* ventricle, remaining healthy, and therefore reaching but a short way down, looks like an appendage to the *left*."

As we have had occasion to refer to the beautiful plates of this book,—plates which had the advantage of being executed by Mr. Skelton (who executed the engravings of Dr. Baillie's work on Morbid Anatomy),—we subjoin a list of them: —"Plate I. Figure I. Pulmonary Artery compressed by a Mass of Cartilage. Figure II. Obstruction at the Mouth of the Pulmonary Artery.—Plate II. Diseases of all the Valves of the Heart.—Plate III. Bulky Solitary Adhesion at the Front of the Heart; with one-half of the Tricuspid Valve completely bound down.—Plate IV. The Left Half of the same Heart as in the last Engraving.—Plate V. Figure I. Thickening, Ossification, Excrescences, and Rupture of the Aortic Valves. Figure II. Excrescences of one of the Aortic Valves.—Plate VI. Aneurism of the Left Auricle. Hypertrophy and Dilatation of Both Ventricles.—Plate VII. Front View of the same Heart as in the last Engraving.—Plate VIII. Figure I. Aneurism of the Ascending Aorta. Figure II. Aneurism of the Left Ventricle; with Lardaceous Tumors on the Surface of the Heart."

their size, then they can furnish no proper obstruction; and a quantity of blood will return. Thus disease of the valves may prevent the blood from going in a natural course; or they may allow it, in some measure, to come backwards.

These occurrences could not be known, formerly, in the living subject; but now that the ears are employed, they may frequently be detected during life. I presume you are aware, that if you place your ear over the heart, or employ the stethoscope with one extremity placed over that organ, you hear two sounds. The first sound which takes place is rather long; and is immediately followed by a short sort of sound; so that you have a double sound when the heart acts. The first sound which you hear, occurs at the moment of the impetus of the heart against the side; and the second immediately after it. The stroke of the heart and the first sound take place both together; and occur, if you feel the pulse at the wrist, a little before it;—at least, in most cases. Sometimes you cannot distinguish any interval at all, between the stroke of the heart and the pulse at the wrist; but very frequently you can; and this, of course, arises from the distance of the radial artery from the heart. If you feel the artery nearer the heart, you find a less interval; if you feel the temporal artery, or the aorta itself, there is no interval at all. You may feel the aorta at the arch; and if you place one finger on that, and one on the heart, you find that the stroke at each is simultaneous; but if you place one finger on the wrist, you find there is an interval; but it is exceedingly small; and it is quite clear that the pulse at the wrist, is immediately consequent on the impulse of the heart. The second sound, which takes place after the impulse of the heart, always occurs, in health, after the pulse at the wrist; and the pulse of the wrist and the stroke of the heart occur so close together, that in common language we may say they are simultaneous. Laennec supposed that the first sound of the heart took place from the contraction of the *ventricle*; and that the second occurred from the contraction of the *auricle*; and so he was able to predict where an obstruction would be found after death.

With regard to the nature of those sounds which occur in health, I will not describe them; because you have only to place a stethoscope, or your ear, over your friend's chest, in the region of the heart, and you will immediately perceive them. But if there be an obstruction, so that the blood cannot pass freely out of the left ventricle into the aorta, or from the right ventricle into the pulmonary artery, then, in most instances, there is an alteration of the sound. If the mouth of the pulmonary artery, or of the aorta be obstructed, a similar effect is produced to that resulting from the arch of a bridge being narrowed; so as only to permit the stream to pass through it at a certain pace. The stream passing through a narrowed arch, makes a whizzing sound, which was not heard before; and so if the blood, while passing from the ventricles into the pulmonary artery or the aorta, meets with an obstruction, it produces a sound not heard in health. This sound occasionally resembles that produced

by a pair of bellows; and is therefore called a *bellows-sound*; or, in French, *bruit de soufflet*. Occasionally it is shrill; and then it is called a *rasping sound*, or *bruit de râpe*. Sometimes it is like the action of a *fine saw*; and then it is called *bruit de scie*. It may resemble the sound of *bellows*, the sound of a *file*, or the sound of a *saw*. We want one word for all these sounds together; and perhaps the term "*preternatural* sound" would be a good generic term for embracing them. I have used it, in my work on "Diseases of the Heart," to comprehend them all.

If the obstruction be between one of the auricles and the corresponding ventricle, then it is the *second* sound which is altered; and it is after the beat of the heart,—after the pulse at the wrist, that you hear this preternatural sound;—whether it be a *bellows*, a *sawing*, or a *filing* sound. There is a difference of opinion, at this moment, as to whether Laennec was right in ascribing the second sound to the contraction of the auricle; and I am inclined to believe that he was wrong. My reason is this. On passing the stethoscope over the heart of a jack-ass, when the heart was laid bare,—according to the experiment of Dr. Hope,—I heard the second sound when the stethoscope was placed upon the ventricle. The sound clearly came from the ventricle; and I was told by others who could see what happened, that the auricle did not contract at that time. But although I dare say the sound did not arise from the mere contraction of the auricle, yet I have no doubt that it took place at the very moment when the blood passed from the auricle into the ventricle; because, as soon as the two ventricles have contracted, they dilate; and the instant they dilate, the blood must rush into them. A vacuum is formed by the dilatation; and the blood must rush out of the auricles into them; and I believe this is a passive circumstance. The contraction of the auricle appears to have little to do with it. When the ventricle dilates, the auricle empties itself; but, as far as I could observe in the experiment made, it does this in an irregular manner. However, a vacuum cannot be formed in the *ventricle*, without the blood escaping from the *auricle*; and therefore I am quite sure, that when there is an obstruction between the auricle and ventricle, you hear a bellows-sound at the moment you should hear the second natural sound of the heart. You may form an accurate diagnosis in this way. I have done it over and over again; and have always predicted the exact part where the obstruction existed. I have always taken it for my guide, that where a bellows-sound was heard at the moment of the stroke of the heart against the side, there was an obstruction, either at the mouth of the *pulmonary artery*, or at the mouth of the *aorta*; and, on the other hand, where a bellows-sound has been heard *after* the first natural sound, that then there has always been some obstruction to the course of the blood from the auricle into the ventricle; or else that the valves at the mouth of the aorta, or of the pulmonary artery, have not done their duty; so that the blood has partly rushed back into the ventricle. Whatever may be the cause of the second sound heard in the heart in health,—

whether the dilatation of the ventricle or not, it is at that moment that you hear the bellows-sound, when there is an obstruction to the course of the blood from the auricle to the ventricle.

Laennec (as I believe I before remarked) states that at the moment of the pulse at the wrist,—at the moment of the stroke of the heart against the side, the blood leaves the ventricles, and rushes into the pulmonary artery and the aorta; and that it is immediately after this, that the blood leaves the auricle, and rushes into the ventricle; —so that the first sound of the heart occurs at the moment of the stroke of the heart, and the pulse at the wrist, or just before it,—the difference being exceedingly minute; and depends upon the rush of the blood from the ventricle; and the *second* sound depends upon the rush of the blood into the ventricle from the auricle. Laennec, I believe, considers, the *first* of these sounds to be the effect of contraction of the *ventricle*; and the *second* to be the effect of contraction of the *auricle*. It perhaps may be doubted whether, in the latter case, it arises from a contraction of the auricle; but I think there can be no doubt it takes place at the *period* he mentions; though, in all probability, it arises from the flow of the blood out of the one cavity into the other. It has been said, that if you inspect the heart of a living animal, you see that the auricle contracts before the ventricle;—the reverse of what Laennec has stated. This, certainly, I have seen. But it is to be considered, that the muscular part of the auricle is very inconsiderable; that the greater part is a mere venous sinus; and, I imagine, it must be when the ventricle is dilated, that the blood rushes into it. Now the ventricles dilate the moment after they have contracted; and therefore I should conceive, that this rush of the blood from the auricle, is an effect independent of the *contraction* of the auricle;—that it is merely the effect of a vacuum produced in the ventricle by its dilatation; so that the blood rushes on, as it does from the venæ cavæ. In the experiments I saw, the auricle contracted with great irregularity;—sometimes *before* the ventricle, sometimes *after* it; and I have seen five or six contractions of the auricle, to one of the ventricle; so that I do not think the ventricle is filled by the action of the auricle. Another great argument is, that I have been able to make an accurate diagnosis, by observing the periods of the morbid sounds, as Laennec has stated them. Whenever there has been a contraction of the mouth of the aorta, or of the pulmonary artery, the preternatural sound,—whether it has been a *bellows*, a *sawing*, a *rasping*, or a *cooing* sound,—has been at the moment of the stroke of the heart. Whenever the tricuspid, or the mitral valve, has been diseased,—whenever I have seen the opening between the auricle and the ventricle (or either side) contracted or narrowed, then the morbid sound which I have heard has always been *after* the pulse,—*after* the stroke of the heart;—shewing that it is at that time the blood leaves the auricle; that is to say, it is as soon as the ventricles have emptied themselves and dilated again. Details have been published of a post-mortem examination, which took place abroad. It was the case of Dr. Hopkins,

who was formerly a lecturer at Mr. Grainger's Medical School, in the Borough. It is stated in the account just referred to, that the left ventriculo-auricular opening of the heart was ossified, in its whole circumference, for three lines in breadth; and that there was a singular contraction of the opening. It so happened that this gentleman came to me, about six months before his death, with œdema of the lower extremities, and difficulty of breathing. I examined his chest; and, in a moment, found signs of dreadful disease of the heart. I made pretty extensive notes of the case, at the time; and founding the diagnosis on what Laennec has said, I stated there was disease of the mitral valve. In that case, I heard a very extraordinary sound, immediately after the stroke of the heart. It was not a bellows-sound, but a variety of preternatural sounds; and sometimes there were two or three of them in rapid succession. It occurred immediately after the pulse; and was heard on the left side of the heart's region. When I listened with the naked ear, instead of this extraordinary sound, it appeared like the sound of a saw. I did not doubt that he had disease of the mitral valve; or, if there were not an obstruction to the course of the blood from the auricle into the ventricle, that the aortic valves were so diseased, as to let a little blood come back. I therefore wrote down in my note-book,—"Disease of the mitral valve, or else imperfect action of the aortic valves." Of course, if Laennec be wrong, it stands to reason that the sound I heard, ought to have been heard at the moment of the heart's action. But here is a dissection taking place in a foreign country, by a person who knew nothing of me or of my diagnosis; and here are the post-mortem examination, and my written account of the state of the heart, corroborating each other. This shews us, as more than twenty or thirty cases have done before, that Laennec is right. He may be wrong in saying that the auricle contracts then; but I cannot consider him incorrect in saying that the blood rushes, at that moment, from the auricle into the ventricle. Some ascribe the sound to the circumstance of the ventricle dilating; but I am not aware that it gives a sound. I should think it more likely that it is owing to the rush of blood into the ventricle. I regretted, when Dr. Hopkins went abroad, that I should not have an opportunity of comparing the dissection with the diagnosis; and therefore I was gratified when I saw the case published. *

Why it is that you have sometimes a bellows-sound, and sometimes a sound resembling the action of a saw or a file, is not well known. Some have supposed, that when there is ossification you have a shrill sound; but that is not proved. I should imagine that it depends on two or three things together. If the opening be very small, and the action of the heart be driving on a large quantity of blood, I should

* Laennec's account of the sounds of the heart, is now pretty well exploded. Investigations on the subject have been pursued, with great ardour, by Drs. Hart, Stokes, Corrigan, Haycraft, Adams, Hope, Williams, and Badham; and, more lately still, by the London and Dublin Committees of the British Association for the Advancement of Science. No settled creed has yet taken the place of the rejected one.

think it would be shrill; but if the opening be small, and the action of the heart not very strong, then the feeble influence of the blood will, I should think, not cause the shrill sound. If the parts were soft, then you might have a shrill sound.

It has been supposed that the auricle contracts before the ventricle,—for this reason;—that in the case of an obstruction, you see the jugular veins swell at the time of the stroke of the heart. Before the pulse is felt, indeed, the jugular veins will sometimes swell, in a case of disease of the heart; and will pulsate strongly. It is supposed that when the auricle contracts, then an obstruction must take place in the veins, and the blood accumulate there. For myself, however, I do not think that, at the time the auricles contract, there is any obstruction in the veins at all; for when they lose their blood, the ventricles must be open for the blood to rush into them; and, consequently, there is a free passage for the blood. When the ventricle is *contracting*, there must certainly be a great obstruction to the blood; but the moment the ventricles *dilate*, that moment the auricles act; and the action of the *auricle* cannot cause an obstruction, because there is a free course for the blood to rush into the *ventricle*. It is hardly possible to make you understand the subject in the short space I can now devote to it; but you will see the arguments at page sixteen of my book.*

When you hear these peculiar sounds, a moment after the pulse, and after the action of the heart, you cannot say with certainty, that they arise from a difficulty to the transmission of the blood from the auricle; and for this reason. If the valves at the mouth of the pulmonary artery and the aorta do not do their duty, but let back a portion of the blood, (as is very common in the case of the aorta), I believe the rushing back of a small quantity of it, will occasion the bellows-sound. You are aware, that the moment the ventricle has acted and dilates again, the blood attempts to rush back into the vacuum; but is prevented by the three aortic valves, which are filled out in a moment. But if it so happen that one is torn, or becomes corrugated and small, then a certain portion of the blood will regurgitate; and as it is not the *whole* of the blood in the aorta that can go back, but a *minute portion* that passes through the small opening which is left, (the valves doing their duty to some extent), that is sufficient to cause the bellows-sound. If the *whole* of it regurgitated, doubtless there would be *no* bellows-sound; but if only *one* valve be torn, or corrugated, or if the whole of the valves be *partially* corrugated, then the small portion which returns causes the bellows-sound. Now you will see that this must take place synchronously with the emptying of the auricles. The same cause which makes the blood rush from the auricles,—namely, the dilatation of the ventricle,—also attempts to make the blood rush back from the aorta and pulmonary artery into the ventricle. The blood attempts to go from the *auricles*, and does so with success; and at the same instant it attempts to do so

* For these arguments see Appendix, No. VIII.

from the *aorta* and *pulmonary artery*, but cannot; and it is at this moment that we have the morbid sound. Suppose it is one of the auriculo-ventricular openings that does not do its duty;—suppose the tricuspid valve on the *right* side, or the mitral valve on the *left*, is bound down on one side; or suppose it is diseased, so that there is a constant aperture there, through which a certain portion of blood must rush back from the ventricles into the auricles;—then you have a bellows-sound, from this cause, at the time the ventricles contract. I have frequently heard a bellows-sound, at the moment of the pulse;—arising, not from an obstruction to the course of the blood out of the ventricles, but from a valve between the auricles and ventricles not doiug its duty; so that a small portion refluxed. Before I was aware of this circumstance, in one or two cases, I gave a false diagnosis; and said that there was an obstruction to the course of the blood from the ventricle; whereas it turned out that the valve between the auricle and ventricle, was not performing its functions properly. Hence, when there is a bellows-sound at the moment of the heart's action, it may arise from disease of the *aortic* valves, or from disease of the *mitral* valve; and when the bellows-sound takes place *after* the pulse, it may be the result of an obstruction to the course of the blood from the *auricle*, or from a certain portion rushing back into the *ventricle*. You may say, in every case, that it is caused by one of these two circumstances.

The first case in which I found I had made a false diagnosis, was one of which I have given an engraving.* The preparation is at St. Thomas's Hospital. There was a loud bellows-sound at the moment of the pulse; and I therefore concluded, that there was an obstruction at the mouth of the aorta, or of the pulmonary artery. But I found that the mitral valve was bound down; so that there was a constant opening; and when the ventricle contracted, the blood refluxed freely into the auricle.

You may have these diminished openings from various causes. Sometimes the valves are diseased in the way I have shewn you. The valve may be indurated,—become cartilaginous,—become bony; and the opening may be organically diminished. The aperture is sometimes decreased by excrescences. Twice I have seen the valves perfectly sound, and the pulmonary artery contracted immediately beyond the valves; so that a very minute aperture only existed, for the blood to escape through. In one of these cases the disease arose (as it does in so many instances in young persons) from violent pericarditis. The pericarditis had gone on to produce cartilage under the pericardium; and the cartilage had dipped down so much into the substance of the heart, that it pressed upon the origin of the pulmonary artery, and there produced a great obstruction. In that case there was a bellows-sound, heard at the moment of the pulse. I heard it on the right side of the heart's region, in the situation of the right ventricle; and it was written down in the hospital-books,

* See Plates III and IV of Dr. Elliotson's work on the Heart.

—"Difficulty to the transmission of the blood from the right ventricle to the pulmonary artery." What the cause was, I did not know; but a mass of cartilage existed in the substance of the heart; extending from the inner surface of the pericardium, down into the substance of the heart; where it produced a great diminution of the calibre of the pulmonary artery. You will find a representation of the case in one of my plates.* I have never met with but two cases of obstruction of the pulmonary artery. Disease of the valves of the pulmonary artery, is exceedingly rare. In fact, you are aware that all diseases are far less common on the *right* side of the heart, than on the *left*. In the second case the diagnosis was equally correct. There was a loud bellows-sound on the right side of the heart, at the moment of the pulse; and after death just such a disease was found as I have now described to you;—that is to say, the pulmonary artery was exceedingly diminished, so that the blood could not escape from the ventricle. There is an engraving, in my work, of a

* The plate here referred to is the first; in which the case in question is the subject of Figure I. It is described as,—"A portion of the right ventricle of the heart in a middle-aged man, in which a mass of cartilage compressed the pulmonary artery at its origin. Through an oversight, the specimen was allowed to putrefy; and the whole was destroyed, except (fortunately) the portion of the right ventricle at which the artery rises, the semilunar valves, the commencement of the artery, and the cartilaginous mass. Besides various symptoms from pulmonary and other cardiac disease, there had been a bellows-sound at the lower part of the sternum and to the right of it, at the moment of the pulse. The production of cartilage originated in pericarditis. The pericardium was throughout coherent and thickened, and was cartilaginous in several other points than where the great mass existed."

In reference to this case, and another of a similar description, Dr. Elliotson has the following interesting remarks, at page 19 of his work:—"Twice only have I heard the preternatural sound from an obstruction (visible after death) to the entrance of the blood into the pulmonary artery. In each case, the pericardial cavity was abolished by complete cohesion of the parietal and cardiac portions of the pericardium. In some spots, the membrane was cartilaginous; and, in each case, a knob of cartilage dipped from the pericardium so deep into the substance of the heart, as to narrow the right ventricle considerably, just at the origin of the pulmonary artery. In one of the cases, the pulmonary artery was contracted to the dimensions of the brachial. Unfortunately, I have not both specimens; for one body was opened, after its removal from St. Thomas's Hospital, in an alley of a miserable back-street in the Borough; while three Irishmen stood at my side looking so determined, that I did not venture to attempt to gain possession of the parts. The other specimen was allowed to macerate in water till it was nearly spoiled; but the knob of cartilage remains. A bellows-sound had been heard constantly in each patient, at the ventricular action, synchronously with the pulse, and loudest at the lower part of the sternum;—the region of the right ventricle. As may be imagined, the general venous system suffered an accumulation of blood;—the eyes suffused; the face of a leaden hue; the lips purple; the external jugulars, and superficial veins about the angles of the jaws and clavicles, exceedingly distended; and the legs anasarcous. The pulse was quick and irregular; but, from the obstruction existing *before* the blood entered the lungs, the dyspnœa was inconsiderable. The diagnosis of the cases was so evident, that it was pronounced long before death took place; and the two cases stand recorded in the public books of the Hospital. There was no symptom, nor any *intensity* of symptom, referrible to the adhesion of the pericardium. The obstruction explained every symptom."

case which I did not see; and therefore I do not know what the particular symptoms were; but there was a loud bellows-sound.* The case occurred at St. Bartholomew's Hospital; and the heart was shewn me when lecturing at the College of Physicians. The patient was a young woman, and died from this affection. I should think it was a case of malformation; because I did not perceive any sign of disease of the heart. She was dropsical all her life; and, at last, there were signs of great obstruction. The older she grew, the more the heart increased in size; but the opening never enlarged. There were more and more ill effects the longer she lived. These are very rare cases indeed. If any thing, by chance, press upon the aorta, or upon the pulmonary artery, you have this bellows-sound. Although there may be no disease of the vessel itself,—no disease of the valves,—no disease of the opening, yet extreme pressure will have the same effect. I recollect seeing a case where there was a piece of bone between the aorta and the pulmonary artery; and it pressed on both. There was a bellows-sound at the time of the pulse, on both sides of the chest.

You may, however, have a preternatural sound, while the opening remains quite natural; quite as it should be. I think we had better use the word "*preternatural*" as a generic term, to include all the sounds I have described. The cavity *behind* the opening, however, is very much dilated; and in that way the opening is *relatively* small, although not *absolutely*. Nature, of course, has established exact proportion between the size of the *openings* and that of the *cavities*; and the natural dimensions are those which allow the blood to pass through in the most easy manner, and with the least noise. Thus, the natural proportions, you perceive, may be destroyed in two ways.

* This engraving is the second in Plate II. The following observations are made respecting it:—" Part of the interior of the right auricle and ventricle of a heart, in which the substance was grown together round the mouth of the pulmonary artery; leaving a very small opening, beyond which was the real mouth of the artery, of its natural size, with its valves. I fancy that the state was congenital; for there were no other marks of disease; whereas there was an evident malformation, in the existence of two little supernumerary right ventricles;—one leading from the pulmonary artery, just beyond the valves; and the second leading from the first. Besides this, the patient (a very young woman) had *always* suffered from dyspnœa. She died at Bartholomew's Hospital, with great dyspnœa, venous congestion, and dropsy. A strong bellows-sound was heard. I did not see her; but the specimen is deposited by Dr. Hue, in the Museum of the College of Physicians. The walls of the right ventricle appear to be grown up round the mouth of the pulmonary artery; so that the opening from the ventricle is no larger than a goose-quill; and a short canal, of this dimension, had to be traversed by the blood, before it reached the mouth of the artery, which is of the usual size."

The following observations, in connexion with this case, are exceedingly interesting:—" Disease of the mouth of the pulmonary artery, is still rarer than thickening and narrowing of the tricuspid valve. A case is mentioned by Bertin, where a sort of hymen existed at the mouth of the pulmonary artery; but it was probably congenital; and this is the only instance of obstruction, that he ever saw at that spot. I have never seen obstruction from disease of the pulmonary semilunar valves. Bertin refers to two;—one in Morgagni, and one seen by M. Louis at La Charité."

The cavities may remain the same, and the openings become too small; or the openings may remain the same, and the cavities become too large. In the latter case, the openings are no longer large enough for the cavities; and in either case you have the bellows-sound. You must not be surprised, therefore, after a bellows-sound, to find the openings in a natural state; because the cavity may be too large. Nay, when this is the case, the least alteration in the position of the heart, will sometimes cause a bellows-sound; and by position, the free course of the blood from the left ventricle may be destroyed. I once had a very curious case of this kind. A woman laboured under ascites; and I found a bellows-sound in the heart. I was anxious to know the cause of the ascites; and wished to ascertain whether there was organic disease. I examined the heart, and found a bellows-sound at the moment of the pulse. She was tapped; and no sooner was the operation performed, than the bellows-sound went away. The water accumulated again, and with it the bellows-sound returned. In this case, after death, the opening was found healthy; but the left ventricle was dilated. It appeared to me, in that case, that the diaphragm being pushed up by the water, tilted the heart a little,—prevented it from being quite in its natural situation; and caused the apex to rise in such a way, that the passage of the blood into the aorta would be a little impeded. If the position of the heart be altered,—if the apex be lifted up, no doubt the blood will experience a difficulty in going into the aorta. In this case, it was quite proved that it arose from some such circumstance; because, when the heart was pushed up with the diaphragm by the water, there was a bellows-sound; and when the diaphragm was let down,—the heart going with it,—the bellows-sound ceased. In any case where you hear a bellows-sound at the moment of the pulse, you *may* find pressure from the abdominal viscera. When a person is upright, and the bellows-sound takes place at the moment of the stroke of the heart, if you make him lie flat, you find the bellows-sound increased; —owing to the abdominal viscera pressing up, and the apex becoming a little tilted. I have frequently not heard the bellows-sound at all, when a person labouring under disease of the heart has been standing up; but on making him lie down, I have heard it distinctly. In almost all cases, when there is a bellows-sound at the stroke of the heart, arising from an obstruction to the blood in passing from the left ventricle, if you make the patient lie down, you hear it with greater force; and I should advise you, therefore, in these cases, to listen to the sound in both ways. I presume the circumstance arises from the same cause, when a bellows-sound is heard in the case of the aorta. When a person lies down, the abdominal viscera press against the diaphragm, and alter the position of the heart; so that the blood cannot so easily escape from the aorta. You know that when there is difficulty of breathing, patients wish to sit up; and then the heart falls more into a vertical position. In hypertrophy of the heart, you frequently hear a bellows-sound where there is no great dilatation. If it so happen that the substance

of the heart is much thickened,—that the columnæ carneæ are much thickened near the mouth of the aorta (towards the semilunar valves),—the increase of the flesh of the heart will cause a little obstruction; so that you have a bellows-sound. Frequently, therefore, in opening bodies where there has been a bellows-sound, you find some other cause than disease of the opening. You may find something pressing on the outside of the aorta;—you may find the substance of the heart increased;—you may find the heart out of its due position;—you may find the cavity behind the opening so much dilated, that the latter, although of its natural dimensions, is not big enough for the enlarged cavity which forces its blood through it.

It would appear that sometimes the bellows-sound is only a temporary phenomenon, dependent upon spasm or irritation. Sometimes there would appear to be a spasm in the neighbourhood of the opening; for a person will have a bellows-sound one day, and not another. It is said that hysterical women sometimes have this bellows-sound; and they have spasmodic affections of various parts.

Frequently, if you take blood away, you diminish the bellows-sound, and even remove it altogether. If you lessen the quantity of blood that has to go through the opening, there will be less obstruction felt; and therefore by bleeding to a certain amount you diminish (or, it may be, entirely remove) the bellows-sound. Sometimes in inflammation of the heart this bellows-sound is heard; and as you subdue the inflammation, it may never return. In this case, the parts may be thrown into a spasmodic state;—just as in the case of the urethra, when that is inflamed. You know that a spasmodic stricture may take place, so that no water can pass; and on bleeding the patient, the affection is removed. So, I conceive, it may happen with the opening of the heart. Again, the bellows-sound will be heard if you bleed a patient *too much*. You may bleed a patient till you get a sharp pulse; and then you may be led to suppose that inflammation exists, although the person may be blanched like wax. Now when a patient has been thus reduced, I have been told, by many, that a bellows-sound has been heard. I presume that, in this case, the bellows-sound arises from the violent action of the heart. It attempts to drive the blood away faster than it can go with ease. You may, however, have a bellows-sound simply from great *plethora*. There is such fulness of the heart, that the blood cannot escape through the opening; and, on the other hand, you may have such a rapid action of the heart, that more is attempted to be forced through it than the opening will allow.

In observing these morbid sounds, I advise you to use the stethoscope without the plug. Laennec does not mention the circumstance; but if you examine the sounds of the heart with the plug in the stethoscope, and then take it out, you will generally hear the sounds far louder without the plug. I am quite sure of this. I have proved it myself, and mentioned the circumstance to others; and they have always said they found it to be the case. It is right to examine a patient labouring under disease of the heart, with the plug

in as well as *out*; because, when a plug is in the stethoscope, you have a larger surface for the heart to strike against.*

There are, of course, other symptoms induced by this difficulty to the transmission of blood, besides those which are to be learned by the ear. If there be any difficulty to the transmission of blood in the heart, the cavity behind is very much disposed to dilate. The blood not going out with ease, accumulates; and gradually causes a dilatation. This is a very common circumstance; but it is very curious that you do not, by any means, always have the dilatation in the cavity immediately behind the obstruction. The auricles are much thinner, you know, than the ventricles; and therefore they more easily become dilated. In a case of obstruction of the mouth of the aorta, it is very common not to see the left *ventricle* dilated, but the left *auricle*, and even the mouth of the auricle. The effect of an accumulation of blood, is frequently felt at a great distance from the seat of the obstruction. Sometimes, in the case of obstruction at the mouth of the aorta, you see the left *ventricle* dilated; but more frequently it is the *auricle*. In disease of the mitral valve, you of course cannot expect dilatation of the left *ventricle*, because it is beyond the obstruction; but you may expect dilatation of the left *auricle*; and you may expect dilatation of the *right* auricle, or even of the right *ventricle*; because all these parts are *behind* the obstruction, wherever that obstruction may be; but it is by no means an invariable rule, that the dilatation should be immediately behind the obstruction. When there is an obstruction at the left side of the heart, either at the mouth of the aorta or at the auriculo-ventricular opening, you will have the obstruction shewn particularly in the lungs. Dr. Wilson, of St. George's Hospital, has mentioned that he has frequently seen what is called "apoplexy of the lungs," after an obstruction of the mitral valve. You will continually meet with an obstruction of the mitral valve, without any such circumstance; though certainly it will very frequently happen; but in almost every case, you see a general fulness of the lungs. Although you may not see pulmonary apoplexy, you may expect to find a great congestion of blood in the lungs; and this soon shews itself in the whole of the venous system. The obstruction is soon felt beyond the lungs, on the right side of the heart.

* The following additional observations on this subject, occur in a note at page 16 of Dr. Elliotson's work on Diseases of the Heart:—"Laennec employed the stethoscope in its entire state, to examine the heart; and the presence of the plug is certainly advantageous in ascertaining the *impulse*. But for observing the *sounds* of the heart, the instrument is much better without the plug. The excavation renders the sounds far more audible." The same note contains some remarks on the form and materials of the stethoscope itself:—"After trying an infinite variety of stethoscopes, I am satisfied that a stethoscope in one piece, of the most simple form, and of cedar-wood, is inferior to none, and superior to many;"—an opinion which agrees with that of another great authority on the subject,—Dr. Stokes. The remark which follows is of great practical importance:—"It is often very useful to make the patient suspend his breath for a few moments, while we are listening to the sounds of the heart. The murmur of respiration is often mistaken for a cardiac bellows-sound; and in dyspnœa, the sounds of the lungs sometimes completely overpower those of the heart."

Of course any obstruction on the *left* side, can only act on the system at large. If the blood do not escape easily from the pulmonary veins, it accumulates in the lungs, and therefore it will not pass freely out of the pulmonary artery; then the right ventricle suffers, and all the venous system. The consequence of all this, is great fulness of the veins of the neck, frequently of the head, and sometimes of all the veins of the body; and then general dropsy;—not only a swelling of the ankles, and œdema of that part; but *general* œdema, which is called *anasarca*,—universal dropsy. And then, from the great accumulation of blood in the head, you have headache and drowsiness, and perhaps apoplexy;—effusion into the brain and upon the brain. The patient's countenance is blue; his lips are pale; and perhaps the nose and eyes look exceedingly livid. In many cases of this description, you will observe effusion first of all about the eyes. Before the face and neck become œdematous, you will see a puffiness of the lower eye-lid particularly. Indeed so striking is it, that many persons have said, that it is an invariable sign of disease of the heart. At any rate, when there is an obstruction to the course of the blood in the chest, you find a puffiness of the lower eyelid.

Besides these, there are symptoms in the heart itself. There is palpitation, a great sense of fainting, and great difficulty of breathing,—particularly on motion. In this and all other diseases of the heart, the lungs are very much disposed to fall into a state of chronic bronchitis; so that the patient not only coughs but expectorates; and perhaps expectorates *blood*; and the difficulty of breathing becomes extreme. The quantity of urine is diminished; and then, frequently, a great accumulation of blood takes place in the liver, as well as in other parts; and at length there is effusion, not only into the pleura on each side, but into the peritoneum; so that perhaps, at last, you have not only œdema, but general dropsy.

There are two or three other points which I wish to speak of, before I leave the subject of diseases of the lining membrane of the heart; and the peculiar and preternatural sounds, to which a narrowing of the different orifices gives rise. These preternatural sounds are heard far more frequently on the *left* side, than on the right; because (as I have repeatedly observed) *all* diseases of the heart are so much more common in that situation. You will find, however, in an infinitely greater number of instances, a preternatural sound at the moment of the stroke of the heart, than either before or after it. I hardly recollect a single instance of a patient at St. Thomas's Hospital, this winter [1831–2], having a preternatural sound of the heart, except at the moment of the stroke of that organ;—so much less frequent is it to hear a preternatural sound at the time the auricles allow their blood to go into the ventricles. All cases of a bellows-sound, in which there was no real narrowing of the openings to be found after death, occurred at the time of the stroke of the heart; and where it has arisen from a temporary cause, and has gone off again, it has been at the same period;

so that the impediment appears to have been at the mouth of the aorta. In the particular case which I mentioned, where a woman had a bellows-sound as long as the abdomen was distended with liquor, and no longer,—for it ceased when she was tapped, and returned again when the water re-accumulated,—it was heard at the moment of the pulse. By far the most frequent seat of it, is the aperture leading from the left ventricle to the aorta.

I need hardly tell you that, in general, the bellows-sound, when it arises from an obstruction of the mouth of the *ventricle*, is heard in the *lower* part of the cardiac region, in the situation of the ventricle; whereas, when it proceeds from a diminution of the opening of one of the *auricles*, it is heard at the *upper* part;—the auricle being situated above, and the ventricle below. You may sometimes hear the bellows-sound, not only in the situation where the obstruction exists, but to a great extent around. I have frequently heard it in the right axilla, when the heart was not at all enlarged; but frequently it is only perceptible at the place where the obstruction exists; and when you do hear it in various parts, it is always loudest in the immediate seat of its cause. You generally, therefore, have it loudest in the case of the *ventricles*, at the *lower* part of the cardiac region; and in the case of the *auricles*, or auriculo-ventricular openings, at the *upper* part. When it is on the *left* side, you hear it loudest in the *left* half; and when on the *right* side (where it is rare) you hear it loudest at the *right* part of the cardiac region.

You will sometimes hear a *double* bellows-sound;—one sound at the stroke of the heart, and then another immediately after it;—like something falling against some other object, and then falling back again directly. I believe that, in these cases, there is a degree of obstruction to the passage of the blood, so that you have the *first* bellows-sound; and then, as the valves do not perform their duty perfectly, but permit a portion to reflux, you have the *second* bellows-sound. It is by no means a rare thing to hear this double sound; though it is not nearly so common as a single sound. When the mitral valve is grown up, so that you have merely a circular opening in the middle, of course there is great obstruction; and as the valve does not do its duty well, some of the blood always comes back, and you have a double bellows-sound. So, in the case of the aortic valves, the opening is sometimes much diminished; and you have a bellows-sound when the blood rushes out; and the semilunar valves being corrugated, a portion returns; and thus you have a sea-sawing sound,—backwards and forwards.

I mentioned that, in the case of the bellows-sound which occurs at the stroke of the heart, it is heard loudest when the patient lies down; and sometimes you can hear it only when the patient is in a horizontal position; but when he is standing up, it is always diminished. You will hear variations in this respect, however, according to the force of the heart. Sometimes the pulse is very irregular; so that first you have a strong thump, then a slight one, and then several strong ones. Now in these cases, if there be a diminution at the

mouth of the aorta, when the heart acts moderately, it gives short strokes; so that the blood is not sent violently through the opening, and therefore it finds its way pretty well; but when it acts violently, such a torrent of blood is driven against the opening, that a great obstruction is felt; and then you have a loud bellows-sound. Thus, when you have a bellows-sound, and the heart acts irregularly, you will sometimes hear it loud, and sometimes very inconsiderable; according to the quantity of blood driven against the opening, and the degree of obstruction experienced. If the parts be not very rigid, when the stroke of the heart impels the blood, it may force its way, and the obstruction will not be much felt; but if the parts will not give way, the greater the impulse, the more is the obstruction felt.

You will sometimes perceive another circumstance when there are these bellows-sounds; and that is, if you lay your hand over the heart, you will find a vibration, like the purring of a cat. It is just the same gentle vibration, as that which you feel on placing your hand on a cat's back, when she is purring. This has been called the *purring thrill.* I do not recollect noticing it in the case of the heart, except where there was a bellows-sound; and it appears to arise from an obstruction. It is nothing more than a jar given to the heart, by the blood attempting to pass through the obstructed opening. It is by no means generally observed; but, every now and then, you will feel a vibration in the region of the heart, at the moment the bellows-sound is heard.

With regard to the heart's action, it varies both as to force and as to frequency. It has been thought that this indicated the want of a free opening; but you will find that intermissions of pulse, and irregularity of pulse (both as to force and frequency), will take place when there is no obstruction; and I do not know the particular state of the heart that gives rise to these variations. You will continually observe this occurrence, in old people, who never had disease of the heart. It is more frequently observed when there is an obstruction of the mitral valve; but it is by no means a necessary consequence of it. The tendency of an obstruction on the left side of the heart, must evidently be to produce a small pulse. The heart may act with great violence; but if there be an obstruction at the mouth of the aorta, the pulse must be small. If there be an obstruction of the mitral valve, so little blood can escape through it from the auricle to fill the ventricle, that the latter has but a small charge to pour forth; and in that case you have a small pulse. Smallness of the pulse may arise from an obstruction between the left auricle and ventricle, just as easily as from an obstruction of the mouth of the aorta; but although it is the effect of these circumstances, it is not the result of them *alone.* You will continually have a small pulse from many other causes; one of which, we shall see presently, is a diminution of the cavity of the left ventricle. If the left ventricle becomes hypertrophied, and the cavity diminished, so little blood can be poured into the arteries, that you have a small pulse. The heart may beat very violently; but when the cavity is

diminished, there is so little room for the blood, and therefore so little blood to escape, that you have a small pulse.

There are no symptoms, except those learned by the ear, to indicate particularly what is the seat of the obstruction; or, indeed, whether there is any obstruction at all; but you will be much deceived, unless everything be taken into consideration. If you hear a bellows-sound, it is not right to infer that there is structural disease of the heart. In order to justify you in thinking that there is organic disease of the heart, the sound ought to be heard *constantly*,—not to-day only, but to-morrow and every day; and even then you ought not to be satisfied of it, unless you find other symptoms;—such as an enlargement of the heart, a dulness of sound to a great extent, anasarca, great distention of the veins, and so on. The whole circumstances of the case must be taken into consideration. Useful and important as it is to attend to the sounds addressed to the ear, yet it is absurd to depend upon any one of these; and to neglect observing the whole state of the patient;—to neglect observing all the general symptoms, which medical men notice in the ordinary way.

It has been thought that when there is an obstruction on the *right* side of the heart, the jugular viens are more distended, and the obstruction in the venous system more evidently shewn, than when it occurs on the *left*. This is no doubt a fact, up to a certain point; but it is to be remembered, that an obstruction on the *left* side of the heart must produce the same effects, after a time. There will at last be great congestion in the lungs; and, in consequence of that, there must be an obstruction to the blood passing on the right side of the heart; then there must be a distention of all the veins, and dropsy. You cannot depend upon these symptoms alone. When you see the veins of the neck distended, that circumstance, considered in itself, will not justify you in saying that the obstruction is seated on the *right* side of the heart. It *may* arise from an obstruction there; but there may be a real organic obstruction on the *left* side. There is, however, this difference;—when the obstruction occurs on the *right* side, there is far less difficulty of breathing than when it takes place on the *left*. The blood is not at all impeded in its progress through the lungs; the obstruction exists before it goes there; but when the obstruction is on the *left* side, it causes great dyspnœa, on account of its producing congestion of the lungs. But great reliance cannot be placed on this point; and for this reason;—in structural disease of the heart, the lungs are much disposed to become diseased too. From their contiguity to the morbidly affected heart, they are much disposed to fall into chronic bronchitis; and when that occurs, you have all the signs of difficulty of breathing, and of congestion of the blood. Still it stands to reason, that if there happen to be no chronic bronchitis,—no affection of the lungs, you will not have dyspnœa when there is an obstruction only on the *right* side of the heart; whereas, if the obstruction be on the *left* side, you must expect it.

I will now proceed to the consideration of diseases of the *substance* of the heart; and I think this arrangement will make the matter plain. First we considered the membrane *investing* the heart; then the membrane *lining* the heart; and now we will consider diseases of the *muscular substance* of the heart.

CARDITIS.

The substance of the heart is now and then, but very rarely, the subject of acute inflammation. I do not myself recollect having seen an instance of it; but you will find a most decided case recorded by Mr. Stanley, in the seventh volume of the "Medico-Chirurgical Transactions." The symptoms of this disease, would be very similar to those of pericarditis. In the case mentioned by Mr. Stanley, there was pericarditis likewise present. I hardly think it can exist without that affection being conjoined with it. Extreme faintness has been observed. There is sometimes extreme faintness in *pericarditis*; but it is not common. In the case of inflammation of the substance of the heart, however, extreme faintness has been noticed; —fits of syncope indeed. After death, in these cases, the substance of the heart has been found soft, and black with congestion. The accumulation is so great, that the substance of the heart is black. In Mr. Stanley's case, the disease had proceeded even to suppuration; so that there were little collections of pus, with which the heart was studded.

HYPERTROPHY AND DILATATION OF THE HEART.

Although the disease I last described is very rare, and must be treated like pericarditis, yet chronic inflammation of the heart is by no means rare. On the contrary, it is a common occurrence. I believe that hypertrophy of the heart is, in general, an inflammatory disease; and my reason for supposing so is, that it is a very common effect of pericarditis. An over-nourished, thickened heart has been found, under the microscope, to be redder than natural; and when the fibres were steeped in distilled water, they imparted greater redness to it, than a similar quantity of fibres from a healthy heart. In hypertrophy of the heart, the coronary arteries are very commonly enlarged; and, in fact, hypertrophy must in general be an inflammatory complaint. Excessive nourishment implies an excessive quantity of blood going to the part,—an excessive action throughout; and therefore one must suppose that it is, more or less, of an inflammatory nature. I will not say it is *inflammation*; but still it appears to me to be of an *inflammatory character*.

Sometimes this morbid nourishment, thickening, and increased substance of the heart, does not arise from an inflammation of the pericardium, and does not follow it; but supervenes on an obstruction to the exit of the blood, from the particular part which is so overgrown. You are aware, with regard to the voluntary muscles, that if any one, or any set of them, be particularly used, it grows; and acquires a larger size than it had before. So, in the case of the

heart, if, from an obstruction existing at the mouth of the aorta, it is obliged to make very great efforts to overcome the obstruction, constant palpitation results, and hypertrophy at last takes place. That is *one* cause of hypertrophy; but it is by no means the *general* cause. Sometimes an obstruction is not followed by any increase of substance. The heart makes what efforts it can; but does not come hypertrophied.

That part of the heart which is more frequently hypertrophied,—over-nourished, than any other, is the left ventricle; or rather the *walls* of the left ventricle. This agrees with the general fact, of disease being more frequent on the *left* side than on the *right*; but the *ventricle* of the left side is far more frequently hypertrophied, than the left *auricle*. When the left ventricle is hypertrophied, it is generally firmer than it should be, and likewise redder; but there is a great variety as to the dimensions of the cavity. If the walls be hypertrophied, and the cavity remain of its natural dimensions, this is called *simple* hypertrophy. The walls have become thicker than they should be; but the cavity is not diminished. Sometimes the cavity is *decreased*. The increase of substance has taken place inwards; so that you have the heart thicker than it should be, and the cavity either correspondingly, or at least in some degree, diminished. This is called *concentric* hypertrophy. Sometimes, however, the opposite to this occurs. The cavity is *enlarged*; so that while the heart is over-nourished, the cavities are dilated; and this is called *eccentric* hypertrophy. Thus we have three descriptions of hypertrophy; one, where the cavity remains of its natural dimensions,—*simple* hypertrophy; another, where it is diminished,—*concentric* hypertrophy; and another, in which the cavity is enlarged,—*eccentric* hypertrophy.

You will perceive, on a moment's reflection, that you may have a great addition to the substance of the heart, and that yet the organ may be neither harder nor thicker than natural; because it may be a case of *eccentric* hypertrophy. If the cavity be greatly dilated, all the additional substance (it may be) is only just sufficient to counterbalance the thinness which would otherwise take place. If a part be not over-nourished, but greatly dilated, it grows thinner and thinner in proportion as it is stretched; but if, while it is being dilated, a great addition of substance is made to it, it may lose none of its thickness. Thus, you perceive, there may be a case of great addition to the walls of the heart; while yet there may be no increased thickness. There is dilatation; and that dilatation, of itself, would tend to make the heart thinner; and the additional substance may be only just sufficient to counterbalance it; and therefore, in giving a diagnosis that the patient is labouring under hypertrophy of the heart, it does not follow that you are wrong if, after death, the heart proves to be no thicker than natural. If, notwithstanding an enormous dilatation, the heart retains its regular substance, it is to all intents and purposes *hypertrophy*.

The thickness which the heart occasionally attains, in this disease, is very great. Sometimes it is not merely double, but treble

its natural thickness. It is said that the natural thickness of the left ventricle in an adult, is about half an inch. Of course there is some variety in this respect. I have not noticed the remark anywhere; but I think we ought not to consider that a heart has been thickened during life, merely from observing that the walls are thicker than they ought to be after death; and for this reason: if a part contracts very powerfully at the time of death, and remains in a state of contraction afterwards, of course it will appear thicker. You know that when any muscle contracts, what it loses in length it gains in breadth, —in circumference. So, if the heart contract very violently, of course it will become thicker; and that thickness may be perfectly independent of any additional substance. But it stands to reason that, in proportion as it looks thicker, the external size ought to be less; and therefore, whenever you see a heart with its walls very thick, and perceive that the external part of the organ is small, I see no reason to consider that there was hypertrophy during life. I presume that what it has lost in *bulk*, it has gained in *thickness*; and that it is the mere contraction which has given rise to the apparently increased thickness of the walls. At a post mortem examination, you sometimes see the heart very small; but on making a section of the organ, you find that the smallness of bulk is proportionate to the thickness of the parieties; and therefore, in order to say that the heart is hypertrophied, you should not be contented with seeing that it is thicker than natural; but you should also find that the external bulk is of the natural size; otherwise you may be continually deceived. A very violent action may take place in the left ventricle at death, and may increase its thickness considerably; but in the same proportion will it lose in breadth.

I had better speak of the left ventricle first; because it is so much more frequently the seat of hypertrophy than any other part. In *simple* hypertrophy, — that is to say, where the cavity is neither increased nor diminished,—and in *eccentric* hypertrophy,—where there is dilatation as well as increased thickness,—the deposition is most frequent about the base of the heart. In the other kind (*concentric* hypertrophy), where the cavity is much diminished, and at the same time the heart is thickened, the addition of substance is the same throughout. The cavity is diminished in all directions; and the increase of substance is as great at the apex as at the base. When the left ventricle is hypertrophied, you will find the septum particularly thickened; and the columnæ carneæ will be double their natural size. If there be any *dilatation*, as well as hypertrophy of the left ventricle, the *right* ventricle (remaining healthy) looks, I was going to say, like a mere little side-pocket. It is quite small, and rather behind the *left* ventricle;—not reaching perhaps more than half way down the heart.

I need not remind you, that the walls of the *left* ventricle are far thicker than those of the *right*; and therefore the case must not be immediately set down as one of hypertrophy, on account of the disproportion between the ventricles. It is well to remember, too, what

is the usual size of the heart. It varies in individuals,—like the face, and limbs, and every other part of the body; but it has generally been supposed, that it bears a proportion to the fist of the individual. So it is said; but this is a mere rough estimate; because a labouring man will have a proportionably larger fist than a very fine gentleman;—arising from the more frequent employment of his hand. Still, however, as a general rule, you may say that the heart bears a certain proportion to the fist of the individual;—that it is about the size of the fist in different ages; but, in a diseased state, it will sometimes be even four times larger than that. Another circumstance must also be remembered; which is, that the walls of the *left* ventricle are not merely thicker than those of the right; but that they are proportionably thicker in *infancy* than in *after life*. You might very readily mistake a case of hypertrophy in infants, unless you were apprised of this circumstance.* Although the substance of the heart, in hypertrophy, is generally firmer than usual, yet sometimes it is only of its natural firmness, and occasionally it is softened; but this is toward the latter stages only. The thickening of the walls is not always uniform. Occasionally you will see one part of the walls much thicker than another.

Next to the *left* ventricle, comes the *right* ventricle, in point of frequency of hypertrophy. With regard to the *auricles*, as they are more delicate and thin than the ventricles, their disease is usually *dilatation*. You will continually find the auricles *dilated*; but rarely *hypertrophied*; whereas the *left ventricle* is every day hypertrophied; and every day it is both hypertrophied and dilated. If it so happen that the heart is both hypertrophied and dilated,—that is, if it is increased in thickness, as well as dilated,—there must, of course, be an enormous addition of substance. If the walls be increased in thickness, and the cavity be also dilated, you may imagine that the quantity of additional substance is enormous; because there is dilatation, which has a tendency to thin; and yet the walls not only maintain their natural size, but even exceed it. If both ventricles be hypertrophied and dilated, then you have an enormous heart;—it attains a frightful size. In this latter case, the heart acquires a roundish form;—the apex being lost, or nearly so.

Hypertrophy, I believe, is sometimes cured. Being in general of an inflammatory nature, it is sometimes, by antiphlogistic regimen and treatment, altogether removed. Of course, in such cases, there

* The following succinct account of various anatomical particulars respecting the Heart, will prove useful, as being easily retained in the memory. It is taken from page 25 of Dr. Elliotson's work:—"It is, in general, said that the heart is naturally about the size of the fist of the individual; that the walls of the *left* ventricle are *twice* as thick as those of the *right*, and in infancy and old age *four times* as thick; but that the columnæ carneæ of the *left*, are less voluminous than those of the *right*, though the *surface* of the left presents a more delicate and intricate reticulation; that when the two ventricles are cut into, the *left* should remain open, but the *right* fall together; and that the *capacity* of the two ventricles is *equal*."

has been no particular tendency to organic disease; and the person has been well treated.

In the case of dilatation, where that is the only thing observable, the heart is generally softened; and where the dilatation is combined with hypertrophy, but bears a great proportion to it, then the heart is generally soft. Dilatation sometimes arises from obstruction. It is not an inflammatory affection; but, from mere obstruction, one cavity or more dilates. Sometimes it would appear to arise from a mere softening of the part; so that the latter gradually gives way. The dilatation is sometimes attended with such remarkable softening, that one cannot ascribe it to any thing else, but a morbid softness of the heart.

The auricles are not only far more frequently dilated than the ventricles, but there is every reason to suppose they are often *temporarily* dilated;—that where an obstruction of a temporary nature exists, they become dilated; and that when that is removed they go down again;—they re-acquire their natural size. The reason for supposing this is, that when the auricles have been much dilated, there has been a dull sound, to a great extent, at the upper part; and when that has been removed, the natural sound on percussion has been heard again. Such cases of temporary obstruction sometimes occur in the lungs. In chronic bronchitis, and other diseases of the lungs, there will occasionally be such congestion, that the blood does not get out readily. This is sometimes the case in the auricles; and when it is removed by nature or art, the signs of dilatation have disappeared again. Dilatation of the *auricles*, it would appear, is by no means a dangerous thing, and is frequently removed;—not being a matter of very great importance. But as to dilatation of the *ventricles*, I should think that they seldom re-acquire their natural size when they have been dilated. Dilatation of the ventricles usually arises from obstruction at the mouth of the aorta, or some where else, or from a softness of the heart; and of course an obstruction in the heart, of an organic nature, cannot be removed, although you may *lessen* it; and as to softness of the heart, I cannot think it has often been removed, though I have reason to think that it has *sometimes*. I have seen *symptoms* of dilatation of the ventricle give way, when the person acquired strength; but I dare not say that the ventricle was actually dilated, and was really used.

With respect to dilatation of the heart, Bertin mentions three varieties;—just as there are three varieties of hypertrophy. The three varieties of hypertrophy are, first, where there is dilatation of the left ventricle; secondly, where there is a diminution of the cavity; and, thirdly, where there is no change in it. So, in dilatation, there is, first, dilatation *without* any increased thickness of the walls; secondly, dilatation *with* increased thickness of the walls; and, thirdly, dilatation with *thinness* of the walls. A morbid thickness of the walls, is the same thing as concentric hypertrophy. Dilatation *without* an increased thickness of the walls,—the walls being in the same

state as in health,—would only be *eccentric* hypertrophy; because there must have been an addition of substance to the enlarged ventricle, to have prevented its losing a part of its thickness. Dilatation with *thinness* (which is the third variety) has nothing to do with hypertrophy; yet, I think, it is possible for us to be right in saying, that there is hypertrophy even when the walls are thinner than usual; and that is when there is great dilatation,—much greater than the loss of thickness; because the dilatation and the loss of thickness should be proportionate to each other, if there were no additional substance; but if the former be very great, and the latter by no means considerable, then there must have been additional substance deposited.

We will now consider the signs of hypertrophy. The sign which is most noticed by people who do not employ the ear or the stethoscope, is palpitation,—violent action of the heart. You will find in this affection, as in palpitation from most other causes, that the patient lies most easily on his back, or on his right side. The palpitation is felt much more when he lies on the *left* side, than when he lies on the *right*. I do not mean that the heart beats harder; but the palpitation is a source of greater inconvenience to the patient. You will find this to be the general rule. The exceptions are where there is some other cause operating, particularly on the right side. In general, in simple affections of the heart itself, attended with palpitation, the patient lies best on the right side. The heart is then not so near the ribs, as when the patient lies on the left side; and therefore it does not disturb the patient so much. Another symptom is difficulty of breathing, and the least motion makes the patient worse in this respect. Going up a slight ascent, or walking fast, will in a moment cause the patient to be out of breath, in a remarkable manner; so that when you hear a patient say he is out of breath when moving about, you should suspect disease of the heart; and should investigate immediately, to ascertain if it be the case;—so common is it. Then there is, very frequently, uneasiness in the side, and even sharp pain. Hypertrophy is so generally an inflammatory complaint, that the patients continually have pain in the region of the heart. This pain may have passed off before you see the patient; but originally, if not during the whole course of the disease, there is more or less pain in the cardiac region. Besides these symptoms, there is very frequently a disturbed pulse; the pulse is generally quicker than it ought to be, and in many cases it is likewise stronger. Frequently, too, there is dropsy; and the force of the heart is such as to cause headache; and if the vessels of the head are weak, it will cause apoplexy, vertigo, and a throbbing of the temples and neck.

But none of these symptoms are to be depended upon alone. You may have dropsy and palpitation without disease of the heart,—merely from its functions being disturbed. You may have a very violent pulse, and strong palpitation, without any structural disease of the heart,—from a mere general irritability of the whole system; and you may have dyspnœa also. When the heart is disposed to

beat violently,—whether from structural disease or not,—you will have dyspnœa and palpitation. Again, as the walls of the heart may be much thickened, the pulse may be rendered small; because the cavity of the left ventricle is diminished. In the case of concentric hypertrophy,—where the cavity is decreased,—so little blood is sent forth at every stroke of the heart, that there is not enough to cause a good pulse. The heart may beat violently; but so little blood is sent out, that the arteries are not well distended; and hence you have great hypertrophy, and a small pulse. Again,—you may have great hypertrophy of the left ventricle, and great dilatation;—an immense mass of muscular substance;—so that the cavity is very much increased; and yet there may be a small pulse, in consequence of the aortic valves being diseased. Thus you may have a small pulse from two causes;—from the cavity being so reduced, that although the heart acts violently, there is little blood to go out; or from the opening being so reduced, that while there is plenty of blood, there is but little room for it to escape.

The great means of making the diagnosis, is by the application of the stethoscope. When any part of the heart is hypertrophied, you have a strong impulse at that part. As I have observed before, it is generally the left ventricle that is hypertrophied; and, therefore, if you place the stethoscope in that situation, the impulse drives the instrument against your ear at every stroke; and if you remove your head, you perceive that the instrument is jerked. By the "cardiac region," you are aware, is meant the lower third of the sternum, and the cartilages of the fourth, fifth, sixth, and seventh ribs. The heart lies behind those parts. Generally, in health, the left ventricle lies behind the cartilages of the fourth, fifth, sixth, and seventh ribs of the left side; and the right ventricle and auricle under, and behind the lower third of the sternum; so that if there be a very strong impulse at the ribs, without a corresponding impulse any where else, and this is pretty constant, you would infer that it is a case of hypertrophy of the left ventricle; but if the impulse be behind the lower third of the sternum, you would then consider it hypertrophy of the *right* ventricle. Occasionally the *auricles* are in a state of hypertrophy; but that is very rare;—their disease generally being dilatation; and if ever they are hypertrophied, I believe they are almost always dilated at the same time. If there be hypertrophy of the auricles, it is eccentric;—that is to say, they are dilated and thickened also. But usually they are not thickened at all; so that the disease is mere dilatation. It is in the *upper* part of the region I have now mentioned, that you would expect a strong impulse, or any thing else that is morbid, if the *auricles* be diseased; whereas, it is at the *lower* part that you must expect any thing morbid, if the *ventricles* are the parts affected;—the auricles being, as every one knows, at the top of the ventricles;—at the higher part of the cardiac region.

There is no morbid sound from simple hypertrophy. Even the natural sound of the heart is diminished. If it be a case of simple

hypertrophy, or hypertrophy out of proportion to the dilatation, you may have a violent impulse; but the sound of the heart is generally lost. It is a dead thump; as though a muffled sledge-hammer had struck against the chest from within. In a case of palpitation from a nervous cause, you will find both ventricles of the heart thumping hard together; and the sound is rather increased than not. The heart acts sharply; and if there be any alteration in sound, it is louder than usual. But in a case of *hypertrophy*, the impulse is great, but it is confined to the part; and the natural sound is *diminished*. If you attend to this, and take into account the general symptoms I have mentioned, you can seldom make a false diagnosis. If you take the general symptoms only, you may be deceived; but when, in addition to these, you find symptoms in the heart itself, you cannot be mistaken. Many cases of palpitation are called disease of the heart; but if you listen with the stethoscope, and find the impulse is only in one region,—that of the right or the left ventricle,—no mistake can arise. Now and then *both* ventricles are hypertrophied; but then you have no strong impulse higher up than the situation of the auricles. Generally, however, it is the left ventricle only that is affected; and if the *right* be diseased, the *left* usually suffers with it.

With respect to *dilatation*, it is just the reverse. There is *no* increased impulse; but there is an increase of *sound*. When one of the cavities of the heart is *dilated*, the sound is *increased*. It is not in general a preternatural sound. It *may* be so; but this does not arise as a matter of necessity. The natural sound becomes clearer and louder; but there is no additional impulse. Supposing, however, that the case is one of dilatation and hypertrophy combined, you then have both signs united;—you have a great impulse, and an increase of sound. This is the case, provided the hypertrophy and dilatation are proportionate; but if the former be much greater than the latter, then you have a great *impulse*, but *no* increase of sound. If, however, there be great dilatation and very little hypertrophy, then you have a great increase of sound. As you may suppose, where hypertrophy and dilatation take place together, and the hypertrophy is such as to thicken the part, the impulse and the sound are very great. Indeed, the impulse is dreadful. It causes the carotids, and all the arteries in the head, to throb; so that the patient is tormented by a continual pain in the head, and is unable to lie down. He is obliged to keep his head erect, on account of the violent throbbing. In these cases, on account of the enormous increase of the muscular substance of the heart, you have a strong pulse. In very intense cases, you will see the head jerk, at every impulse of the heart.

You must bear in mind the circumstance which I before mentioned;—that when the left ventricle is hypertrophied and dilated together, it does not remain in its natural situation. Its natural situation is filled by it, as it was before; but it extends much more to the right side, so that it will entirely occupy the place of the *right*

ventricle. In such a case, you will have a hard thump in the situation of the left ventricle; but you will also have it farther to the left, and even behind; and you will also have the impulse of the left ventricle under the sternum, in the situation of the *right*;—so that you would think the *right* ventricle was dilated and hypertrophied also; but you find, from the strong impulse in all the arteries, and likewise in the situation of the left ventricle, that it is the latter which is diseased. When the *right* ventricle is hypertrophied and dilated, the impulse does not extend to the *left* side; and, therefore, when you find a great impulse in the situation both of the *left* and of the *right* ventricle, you may infer that the thumping on the right side, depends on the left ventricle.

When the heart is dilated, you have another symptom. From its occupying so much of the space that ought to be occupied by the lungs, you have a dull sound to a very great extent. In most persons in health, when you strike on the cartilages of the fourth, fifth, sixth, and seventh ribs, there is a duller sound there than anywhere else; but if the heart be hypertrophied and dilated, then you have the extent of dull sound much increased. It stands to reason, that whenever a part is dilated,—whether it be the auricle above or the right ventricle or the left ventricle below,—you will have a dull sound over the part; because there is a solid substance there, where it ought not to be; and in the case of great dilatation of the left ventricle, with hypertrophy, you have a dull sound to a very great extent. The same circumstance would arise from a collection of fluid in the pleura; but when you see symptoms of hypertrophy and dilatation,—great impulse of the heart, and the symptoms I have now mentioned,—you may infer that the extent of dull sound arises from the great dilatation of the part.

In the great majority of cases, the symptoms of hypertrophy are in the region of the left ventricle;—that is to say, at the cartilages of the fourth, fifth, sixth, and seventh ribs, on the left side, more to the left still, and under the sternum. The impulse is very considerable; and the pulse is sharp, and for the most part full and strong. Just as, in the case of a bellows-sound,—when there is an obstruction in any of the openings,—it is (more frequently than not) at the mouth of the aorta; so, in examining the heart, it is well always to begin with the left ventricle; because, in nine cases out of ten, or nineteen out of twenty, the disease is situated there. So, again, in a case of consumption, it is well to commence an examination under the clavicles; because phthisis usually commences there.

In *dilatation* of the left ventricle,—whether accompanied by hypertrophy or not,—it is not an uncommon occurrence to hear a bellows-sound; because, although the opening be not at all diminished, yet the cavity is increased; and where the cavity is dilated enormously, it sends forth such a volume of blood towards the opening, that the latter is not capable of letting it pass; and therefore an obstruction is felt. I presume a bellows-sound would arise from the dilatation of any other cavity, if the opening were not dilated also. In hyper-

trophy, *without* such dilatation, there is a bellows-sound,—from the position of the heart being altered a little; and sometimes from the columnæ carneæ, towards the opening, being hypertrophied;—so as to form a little obstruction. But the great symptom of *hypertrophy*, is violent *impulse*; and the great symptom of *dilatation*, is an increase of *sound*,—not a *preternatural* sound. The sign of *obstruction* (whatever the *cause* may be) is a *preternatural* sound; but that merely shews obstruction,—nothing else.

There is another thing to be remembered; which is, that if you examine a person near to the close of his disease, you may find very few of the symptoms present. If a person be near death, although the heart may be greatly hypertrophied, yet it may have so lost its power, that it can act with only very little force; and the symptoms of hypertrophy may have diminished so much, that you would hardly suspect how violent a disease the individual has had, and is dying of. So it is with respect to the bellows-sound. It will diminish before death; because, although the opening has been too narrow, yet the heart having lost its power, sends forth so little blood towards the opening, that it escapes better than before. So, too, in disease of the heart, if you were called in just before death, you really might not be able, sometimes, to make an accurate diagnosis. The heart having lost its power, the patient does not appear so much under the influence of his disease, as he did before.

With regard to the treatment of hypertrophy of the heart, I have no doubt at all that it may sometimes be cured. You find the heart (as I mentioned before) evidently in an inflammatory state. The organ, for the most part, toward the close of the disease, is not only firmer and harder than it should be, but likewise redder; and frequently there is pain in the region of the heart, and even pericarditis also. Now if you make a person live on low diet,—if you cup repeatedly over the heart, keep him perfectly still, and relieve the bowels when it appears requisite,—so that there shall be no congestion anywhere; and if you exhibit colchicum, perhaps digitalis, and sometimes mercury, if he can bear it;—you will then see the symptoms of hypertrophy gradually decline. I have certainly known several cases,—where I had every reason to believe that the hypertrophy was very great,—in which abstinence from meat, spirits, and things of that description,—abstinence from mental excitement,—abstinence from every occupation of mind which could cause anxiety,—abstinence from exercise, and every circumstance that could quicken the pulse,—was followed by a decline of the symptoms; and the patient became comparatively well. This, however, requires a long time; and after the patient appears quite well, he must persevere in the general plan, though it need not be very assiduously carried on.

Local bleeding, for the most part, answers better than general bleeding. It is not very safe, in chronic diseases of the heart, to bleed at the arm; for, now and then, patients will fall into a state of syncope; and it is a dangerous thing, in diseases of the heart, to bleed to syncope. We have all heard of cases, where a patient with

diseased heart has lost more blood than was intended; so that faintness was produced by the abstraction, even of a couple of ounces, and the individual has died. A remarkable instance of this kind happened, within the last two years. A distinguished personage, labouring under disease of the heart, was bled at the arm. The bandage slipped; and although it is said that only a few ounces escaped, yet he fainted and died. It is more safe, therefore, to take blood from the region of the heart itself, by means of cupping or repeated leeches, than to bleed at the arm; for it is dangerous to induce syncope. If you do bleed generally,—as you often may, with perfect safety, when the patient is strong and hearty,—it should not be to the extent of syncope; because patients with diseased heart will sometimes die suddenly. Indeed, it is not an uncommon occurrence; and they die, more frequently than not, through syncope.

In the case of *dilatation*, the heart is generally found soft, and paler than natural. Dilatation may arise from an obstruction at the mouth of the aorta, or at the mitral valve; but more frequently than not, this disease depends upon debility; and therefore the heart is usually found soft. When a deposition has taken place outwards, you may find the organ firmer than natural; but in a case of simple dilatation, or dilatation with hypertrophy, after it has existed some time, the reverse takes place.

Active measures are not required in such a case as this. You have merely to bleed locally, in order to take off the congestion;—to keep an open state of the bowels; and to enjoin rest. Very frequently, however, tonics are required. If you find the pulse soft and feeble, it would be dangerous to take away blood;—the only object of venesection being to remove congestion. Leeches applied to the anus, frequently answer a good purpose, in such cases; but, for the most part, a strong evacuation is not at all required. When, however, there is dilatation, there is (much more frequently than not) hypertrophy, and a disposition to dropsy. From the dilatation, the blood is not sent out so freely as it ought to be; and consequently there is an accumulation, and a tendency to morbid secretion in the cellular membrane, and in the serous cavities; so that great congestion takes place in the liver, and likewise in the head; and there is also a tendency to general effusion. Such being the case, you will find it of very great use to give diuretics; and a combination of three or four, as I formerly mentioned, is best. Squills, digitalis, and acetate of potash, answer very well. In fact, I do not know anything so good. They answer far better than hydrogogue purgatives. You will see patients very much relieved by measures of that description; but if the patient be at all weak, you will find it serviceable to give iron; and I believe the best preparation is the tartrate;* because, in conjunction with other means, it has a tendency to increase the flow of urine, and the discharge from the bowels. I have seen patients with every symptom of dilatation of the heart, lose the greater part of these symptoms, and be able to

* Now called *Ferri Potassio-Tartras.*

go about, after taking the tartrate of iron. As I formerly mentioned, it may be given in large doses. In fact, instead of a few grains, you may give a drachm, or even two drachms, twice or thrice a-day; but still you cannot give it in such large quantities as the carbonate; because it is apt to purge and to pinch;—to do something more than carbonate or oxide of iron.* You will find many persons who cannot take more than a drachm. When it is mixed with treacle, it opens the bowels, causes an increased flow of urine, and strengthens the patient. If it should purge too much, it is a good plan to mix an equal part of the carbonate with it.

In such cases, I should give this tonic in preference to all others; because I know from experience that it answers so much better than they do. You will see many cases of hypertrophy with dilatation, where the patients are in a state of anæmia,—in a leucophlegmatic condition; and if you take blood away, you find it watery, and you make the patient worse. When patients are in a state of anæmia induced by bloodletting, or in that peculiar state in which the blood is not properly manufactured, the pulse will become sharp; and so, in disease of the heart, you will sometimes have a sharp pulse, with great debility of the patient. Whenever I have seen this condition united with disease of the heart, I have abstained from evacuations, and given preparations of iron; and have found the patients improve. But if you notice a tendency to effusion, as shown in the ankles, or if you hear mucous or other rattles in the bronchia, you will find diuretics of essential service. If there be general paleness and debility, then iron is one of the best things that can be given; and if the debility be very great, while you give diuretics, you should exhibit the tartrate of iron; which is both a diuretic and a tonic. With such treatment as this, it is wonderful how much good may be done. You may certainly cure some cases; and even where the affection is very severe, so that a cure is out of the question, you may still do a certain portion of good;—you may make the patient feel better than before, and may prolong life. It is our business to protract life, whether it be desirable for the patient or not. It is our business to act upon a general rule, and endeavour to prolong life; without considering, for a moment, whether the individual would be better *out* of the world than *in* it. If you treat all these cases antiphlogistically, you may do harm. When there is a state of anæmia, the adoption of such measures would be madness. The administration of iron, and even good nourishment, is then the proper treatment.

ANEURISM OF THE HEART.

Occasionally it happens that dilatation of the heart is partial. I do not mean that it affects only one particular cavity; but that it affects only a particular *part*, or particular *parts* of cavities. This disease is, properly speaking, aneurism of the heart. You are aware that if only a particular spot in the whole circumference of an artery is dilated, so that a pouch is formed, it is termed *aneurism*.

* Now called *Ferri Sesquioxydum*.

Occasionally all the coats dilate together at one particular spot, and form a pouch; and occasionally the inner and middle coats only are destroyed; but, in both cases, it is called "aneurism."

Now the same thing will occasionally happen in the case of the heart. There will be dilatation at one particular spot. The word "*aneurism*" was formerly misapplied with respect to the heart; for a dilatation of the whole cavity received that appellation. You will find that, in some books, dilatation of the left ventricle is called "aneurism." If there was dilatation with *thinness*, it was called *passive* aneurism; if there was increased *thickness* united with the dilatation, then it was called *active* aneurism. These expressions ought now to be dropped; but you will find them employed, in this way, in Corvisart's work on Diseases of the Heart; which, at the time it was published, was a very good one. You will find a case of *true* aneurism of the heart,—or dilatation at one spot, so as to form a pouch,—mentioned by Dr. Baillie; and several instances of it have now been collected. Like all other diseases of the heart, it occurs more frequently on the *left* side than on the *right*; and principally on the left *ventricle*. Aneurism is, in itself, a disease of the *arteries*; and therefore there is strong reason for presuming beforehand, that aneurism of the heart would take place on the *arterial* side of the organ. I am not aware that any instance has been known, of the disease occurring in the right ventricle. I believe that, in every case upon record, you will find that it took place in the left. In my work on Diseases of the Heart, I have referred to every case of this disease that I could find upon record, up to the time I published.* The affection occurred once in a patient of my own.

You are aware that aneurism of the arteries occurs much more frequently in *males*, than in *females*; and that is the case with the disease under consideration. In fact, I know of only one instance on record, in which it occurred in a female. The situation of it in the left ventricle is various. In some cases, the pouch has been at the *apex* of the ventricle; and in others,—quite as numerous,—it has been at the *base*. Sometimes it has been found *between* the apex and the base.

The symptoms of the disease are not known. In the case under my care, I had no idea of the man's affection; I only felt satisfied that he had disease of the heart. At one time I thought it was upon the *right* side; and at another on the *left*. As the disease increased, it extended; and did not remain in its original spot. Dr. Baillie says, that the symptoms are similar to those which characterize aneurism of the arch of the aorta; but that is saying nothing; because the symptoms of the latter affection are dyspnœa, and more or less pain at the spot; but a thousand things will give rise to those circumstances. Dr. Baillie says, that the pulse is irregular; but he adds that it is often *regular*; and therefore that also amounts to nothing. In such a case, you will *usually* discover that the person

* These cases will be found in the Appendix, No. IX.

has disease of the heart, but not *always*; because the affection has occurred in individuals, in whom disease of the heart has not been suspected. Once I met with this affection in the left *auricle*; but I have never seen such a case on record. I lately saw, in some museum, a preparation of this description. In the case I met with myself, the left auricle was dilated into a pouch; and the pouch was lined with layers of fibrin;—exactly like aneurism of the aorta. It was not a mere coagulum; for the fibrin was organized. In this case, also, I had no idea of the man's disease. I knew that he had disease of the heart, and I thought it was dilatation of the *ventricle*; but as to this particular affection of the *auricle*, I confess I knew nothing about it. Whether I should now be able to discover this disease in any way, I cannot tell; but I should think I could not, even though I have had longer experience.

In aneurism of the left ventricle, the pouch is sometimes lined by a smooth membrane, and sometimes not; and therefore aneurism of the *heart*, follows the exact rule of aneurism of the *aorta*. You are aware that, in the latter, the inner coat is sometimes not injured at all; but that the three coats are all dilated together at one spot; so that you find the pouch lined by a smooth membrane. Sometimes mere pouches are formed in the heart;—a mere dilatation has existed; and sometimes you will find no lining membrane at all;—the inner membrane of the heart having been destroyed. The heart, then, is subject to aneurism, both true and false;—exactly like the arteries; but instances of the disease are very rare.

INDURATION AND SOFTENING OF THE HEART.

With regard to *induration* and softening of the heart, I may remark that sometimes, when the organ is hypertrophied, it is indurated, and sometimes I have seen induration *without* hypertrophy. When the heart is softened, it is *generally* dilated; but this is not *always* the case. If the softening, however, have existed long before death, I cannot but suppose that dilatation must be the consequence. Induration, therefore, is rather allied to *hypertrophy* of the heart; and *softening* to *dilatation* of it. Hypertrophy is generally an inflammatory disease;—a disease, at any rate, of over-nourishment; and therefore you may suppose that the organ will, in time, become *firmer* than usual; whereas *dilatation* is rather a disease of *debility*; and therefore you may suppose that, in many such cases, the heart will be *soft*. Before death, however, a heart that is *hypertrophied* may become soft.

I do not know any particular symptoms of induration of the heart; but if it result from an inflammatory state, you may expect long-continued violent action of the heart, and a strong pulse. When the heart is softened, the pulse is generally feeble; and after death, there is frequently a quantity of bloody fluid found in the pericardium;—the softened condition of the organ having allowed the blood to exude from the vessels. Sometimes, when the heart is *indurated*, it is not redder than usual. On the contrary, it is rather

pale; and this is sometimes the case when it is *softened.* In carditis, —true inflammation of the substance of the heart,—such congestion takes place, that the organ is dark-coloured; and usually it is soft.*

ABSCESSES AND ULCERATION OF THE HEART.

Occasionally we see abscesses in the heart; and I believe that, for the most part, they occur not very far from the pericardium outside, or the lining membrane within. It is said that they may occur in the middle of the substance of the heart; but I rather doubt that. I think they begin in the situation I have stated. Occasionally, ulceration is seen without an abscess. Of course, when an abscess exists, it may go on to ulceration; and may ulcerate through the pericardium, or through the lining membrane. But sometimes ulceration appears to begin in the lining membrane itself. At least, a little superficial ulceration is seen, without any collection of matter.†

* "With hypertrophy of the heart is generally united some degree of induration. Sometimes induration exists alone, or in great proportion to the hypertrophy. I believe it is attended by palpitation, a full and rather hard pulse, and frequently by pain in the heart. One must suppose it to be inflammatory.

"The substance of the heart is sometimes softened; and the pulse and action of the heart are then feeble and frequent; dropsy takes place, with a disposition to fainting; and the heart is also generally found dilated, and of a deeper or paler colour than usual. This state, though the opposite of induration, may, like it, be the result of inflammation; as softening of other organs, beyond all question, frequently is. Yet softening of the heart, and of all other parts, and even gangrene, probably may occur without inflammation; and sometimes, when it does occur with inflammation, the latter may not be the cause, but only one of the circumstances of a peculiar condition. Very *acute* inflammation of any part generally, I believe, induces a softened state; and though a softened state may also result from a *chronic* inflammation, the latter generally causes *induration.* This is seen with regard to the various muscles of the body, as well as in the various internal organs.

"Great as is the modern improvement in pathology from the knowledge that many diseases are essentially, or to a degree, inflammatory, which were formerly not so regarded, and great as is the improvement in medical practice by the adoption of antiphlogistic measures in such cases, I am satisfied that we are now rather too prone to believe affections nothing more than inflammation, and to treat them only as such;—that many so regarded are not at all inflammatory; or have inflammation, not as a fundamental state, but merely as one circumstance among the morbid actions; or really have inflammation as a *consequence*;—and that the hope of curing them by antiphlogistic measures alone is vain,—whatever relief may be effected by lessening the inflammation which accompanies them. The *deep-coloured* and the *pale* softening of the heart, distinguished by Laennec, occur (according to Bertin),—the former as an *acute*,—the latter as a *chronic* affection. The chronic is often an attendant upon general cachexy; the acute, on pericarditis. But, besides these *chronic* changes, true *acute* inflammation of the substance does occasionally occur."—*Elliotson on the Heart; page* 30.

† "Abscess and circumscribed ulceration are more frequently found than general softening. The ulceration may commence either in the living membrane of the heart, or in the pericardium. But whether the ulceration be the result of an abscess of the heart, or originate in one of these membranes, it may proceed to perforation; or to such attenuation that, on some sudden effort perhaps, rupture ensues."—*Dr. Elliotson on Diseases of the Heart; page* 30.

RUPTURE OF THE HEART.

When an abscess has proceeded to any extent, of course the heart is very likely to rupture; and therefore rupture of the heart has sometimes been seen after an abscess. Sometimes, however, the organ is ruptured without any abscess whatever; and without any particular deviation from a healthy structure,—unless it be softening. I never met but with one case of rupture of the heart; and in that instance the organ was very soft. It occurred in a gentleman who, I believe, was a proprietor of this University *;—a very respectable medical man in the neighbourhood, about sixty years of age, and corpulent. He had three attacks of pain about the præcordia, accompanied with dyspnœa and palpitation; but he had gone out in the intervals, as usual. One morning, however, a fourth attack of pain took place in the region of the heart; and he rang his bell for his assistant, who wished him to have a fomentation. The assistant left the room; the gentleman rang his bell violently; and before the assistant could get up to him, he was dead. On opening him, I found a zig-zag fissure in the front of the heart, in the left ventricle.†

The greater number of instances of this disease, have taken place towards the apex of the heart. It is the apex which is thin; and when the organ grows very thin, or very soft, rupture usually takes place there, or not very far from it. This accident occurs far more frequently in the left ventricle, than any where else; but it may occur in any part of the heart. Some persons have supposed that it *always* takes place in the *left* ventricle; but you will find instances of its occurring in the *right*. George the Second died of this affection.‡ He fell down, one morning, at Kensington. The sergeant-surgeon was sent for, and attempted to bleed him; but could not; and, on opening him, they found that the heart was ruptured, and

* The University of London;—now University College.

† "Harvey is said by Morgagni to have first noticed rupture of the heart. Abundant cases are on record of rupture of the heart, independently of ulceration; and are compared to rupture of the arteries, from violent muscular effort; though generally there is also a want of firmness in the organ. They may occur in every part, but usually happen in the left ventricle; where the most forcible muscular contraction takes place; and a spot too thin, or that is soft or ulcerated, is most likely to occur, and is most exposed to violence, if the heart be made to act forcibly by mental or by muscular causes. It is the apex or its vicinity,—naturally the thinnest part of the ventricle,—that usually gives way in general softness or thinness of the organ. Death is usually instantaneous; but sometimes does not happen for several hours;—differences also observed when the heart is wounded.

"While numerous instances of rupture of the *left* ventricle are on record, we have very few of rupture of the *right*. Yet George the Second perished suddenly of this accident, in 1760; and (what is very remarkable) the Princess of Brunswick, in 1730. Her case, no less than the celebrated one of George the Second, is referred to by Morgagni."—*Dr. Elliotson on Diseases of the Heart; pages* 30 *and* 31.

‡ Some interesting particulars relative to the death of this monarch, extracted from Dr. Elliotson's work on Diseases of the Heart, will be found in the Appendix, No. X.

had let forth a quantity of blood. It is rather singular, that one of the same family (the Princess of Brunswick) died, twenty years before, of the same affection; and not only was there rupture of the heart, but the *situation* of the rupture was the right ventricle. I recollect being once asked, whether a person could mistake syncope for apoplexy; and I referred to the particular case of George the Second. His Majesty fell down senseless, and the sergeant-surgeon attempted to bleed him at once;—evidently presuming that it was a fit of apoplexy. Had he supposed the case to be one of syncope, he certainly would not have attempted to bleed him.

RUPTURE OF THE VALVES OF THE HEART.

Occasionally the valves give way suddenly. A valve has been torn under a very violent effort; and very distressing symptoms have taken place. Great pain has generally been felt; but if that be not present, great dyspnœa and great rapidity of pulse are observed—that is, if the rupture be extensive. If it take place slowly, there cannot be these sudden symptoms. Sometimes, from mere intensity of disease, the valves will become exceedingly fragile, or thin; and will give way without *any* effort;—just as the heart will do, from extreme softening. Sometimes, on the other hand, they will give way under a *violent* effort.* In one of the numbers of the "Medical Gazette," there is a very well marked case of rupture of the tricuspid valve; in which great rapidity and irregularity of the pulse took place, and (I presume) dyspnœa. The patient died six or seven days afterwards. Death does not always immediately ensue on rupture of the heart, when it arises from an internal cause. It *may* take place instantly, and generally does; but sometimes it does not take place for several hours. In the case of the valves, however, a patient may not only live several *hours*, but for several *days*; and, for what I know, a much longer period than that. A very slight degree of rupture of the valves, may only keep up a considerable irritation; and the patient may die from its ill effects, at a very distant period. One author mentions an instance, which occurred after a fall on the right side of the chest; and in which death did not take place for five months; yet it was found that an aortic valve

* "The valves alone sometimes suddenly give way; and I believe that immediate extreme dyspnœa, and rapidity of pulse, are the usual effects of an extensive injury of this kind. They split either from intensity of disease,—from mere fragility, or from some violent effort;—exactly the circumstances in which the inner, or inner and middle coats of an artery, frequently crack and give rise to aneurism. An engraving of a split aortic valve, is given in Dr. Baillie's work. I saw an instance in which the same valves were beset with grains of earth, and obstructed the course of the blood; when suddenly, without obvious cause, all the symptoms were aggravated, and the patient died in a few days. Two of the aortic valves were found rent. In the 'Medical Gazette' for the 20th of last June (1829), an instance of rupture of the tricuspid valve is described. The heart was variously diseased, but not particularly the tricuspid valve; and, during an exertion, a snap had been felt; immediate rapidity and irregularity of pulse had occurred; with syncope, and (I presume) dyspnœa; and the patient had died in six days."—*Elliotson on the Heart*; *page* 31.

was torn.* Sometimes, instead of the valves themselves, the cordæ tendineæ have been found ruptured.†

GANGRENE OF THE HEART.

I have never seen gangrene of the heart. Cases have been *supposed* to be gangrene of the heart; but I should imagine they were only instances of extreme congestion of blood; and had been mistaken, by uninformed persons, for gangrene.‡

OSSIFICATION OF THE HEART.

I mentioned that the pericardium, like other serous membranes, is sometimes ossified; but, generally speaking, I believe it is not the pericardium itself that has suffered this disease, but the subserous cellular membrane immediately below it;—as in the case of the pleura. But, now and then, this ossification has been very extensive; and in proportion to its extent has the muscular substance beneath been atrophied,—wasted away; and I believe this is the nature of those cases which have been called "ossification of the heart." Bone has been deposited under the pericardium, or perhaps under the lining membrane within; and the muscular substance has wasted;—so that the heart has been found little more than a shell. Mr. Burns, in his work on Diseases of the Heart, mentions an instance, where the ventricles were little more than shells of bone: He says that no one ever saw *complete* ossification. From the progress now made in morbid anatomy, I have no doubt that the foregoing are instances of a deposition of bone, external to the

* "If the rupture be not extensive, chronic disease results from the irritation of the laceration, and the imperfect function of the valve;—such chronic disease as hypertrophy of the substance of the heart, dilatation, or structural change of the valves themselves; and death does not occur for some time. Dr. Abercrombie mentions an instance in which, after a severe fall on the left side of the chest, death took place in five months; and an aortic valve was found torn at its base, so as to give the appearance of a ring; and the left ventricle was found hypertrophied and dilated. Morgagni found an aortic valve ruptured."—*Elliotson on the Heart*; *page* 31.

† "In all these instances of rupture of the valves and their attachments, there has generally existed some disease of the heart; and, most frequently, of the valve itself. But occasionally,—just as in rupture of the substance of the heart,—and of the middle and inner coats of the aorta, no diseased appearance is discernible; although one must suppose there is a morbid friability, at least, in those cases where no external force, no effort of voluntary muscles, nor any mental excitement,—some one of which is usually the cause of rupture,—takes place. I met with an instance of a circular hole in two aortic valves, on either side of the septum,—from original defective formation. Morgagni once found a hole in one of the leaves of the mitral valve."—*Elliotson on the Heart*; *page* 31.

‡ "I have not read of gangrene of the heart; but it has been seen soft and black (without any gangrenous smell), from excessive inflammatory congestion of blood; and Cruveilhier gives a view of a heart beset with black patches of congested blood;—similar to those observed in what is absurdly called 'apoplexy of the lungs.'"—*Elliotson on the Heart*; *page* 31.

muscular substance, and a wasting away of the muscular substance itself.*

It is a much more common occurrence to see the *coronary arteries* ossified. Indeed they are very frequently so. The most frequent situation of bone about the heart, is at the mitral valve, and the beginning of the aorta;—for we consider the beginning of the aorta as a part of the heart. Next to that, the most common situation of bone is in the coronary arteries.†

ANGINA PECTORIS.

It has been supposed that ossification of the coronary arteries,—or, at least, a degree of induration amounting to cartilage,—gives occasion to the symptoms called *angina pectoris.* By "angina pectoris" is meant a sudden violent pain, in some part of the chest near the heart, and especially at the sternum;—a pain which causes the patient to stand still if he be walking, and induces a sensation as if he were about to expire. The pain, at first, is felt only at one spot,—in the situation I have mentioned; but at length it extends to the shoulder, darts through to the spine, goes down the arm, and occurs at the end of the fingers. In general the pain is confined to the left side; though there are a few cases where it has extended to the *right* shoulder, and down the *right* arm, and even down the front of the loins; but that is usually after it has existed for some time, longer or shorter, at the sternum, and down the left arm. There is not necessarily palpitation; for you may have this affection without any palpitation at all. Dr. Haygarth, of Bath, has collected a vast number of cases of this description; and has inferred that these symptoms are characteristic of disease of the coronary arteries. He does not say "characteristic of *ossification,*" as some make him; but "characteristic of *disease* of those arteries;—whether it be induration, or the formation of cartilage, or of bone. But it is now ascertained, that angina pectoris does not characterize any particular affection of the heart. You may have it without ossification, or any perceptible disease of the coronary arteries; and, on the other hand, you will frequently find ossification of the coronary arteries, without the symptoms called "angina pectoris." You will find angina pectoris very well described by Dr. Heberden, in an early volume,—

* "The induration of the heart occasionally amounts to a cartilaginous or osseous state. But these changes are almost always originally seated in the living membrane of the pericardium, or in the subjacent cellular membrane. A spot of the heart or its membranes is sometimes so changed. Sometimes nearly a whole cavity becomes a horny case. Mr. Burns declares that he once saw, not only complete ossification of the pericardium, but also the ventricles ossified as firmly as the skull, except about an inch at their apex. The chordæ tendiniæ are occasionally ossified."—*Elliotson on the Heart; pages* 31 *and* 32.

† "The coronary arteries are sometimes ossified; and, not unfrequently, the kind of suffering denominated 'angina pectoris,' is the result. But they may be ossified without such a result; and angina pectoris may exist with various structural diseases of the heart, or without any."—*Elliotson on the Heart, page* 32.

the first or second I believe,—of the "Transactions of the College of Physicians." It is not one of the common symptoms of disease of the heart. In the greater number of instances in which the heart is diseased, in whatever way,—you have not the symptoms of angina pectoris; and although it is a fact, that you frequently have these symptoms when there is ossification of the coronary arteries, or great ossification of the mouth of the aorta; yet it is also a fact that you may have them in almost any disease of the heart whatever; and also that you may have them without any ossification at all.

Such symptoms, it is now well known, will take place without any disease of the heart. A few years ago, some cases were published, which were accurately described as angina pectoris; but in which no disease of the heart was found after death. The truth is, that gastrodynia (spasmodic pain of the stomach, I believe) frequently resembles this affection. The left side of the stomach is situated close to the heart; and a violent pain of the stomach, frequently shoots upwards. Frequently it will shoot as far as the shoulder; and even down the arm. Cases of pure spasmodic or neuralgic pain of the stomach, will give way to stramonium, prussic acid, and remedies of that description; and are shewn to be diseases of the stomach, not only by their ceasing entirely, on the exhibition of remedies calculated to relieve functional disorders of the stomach, but by acidity,—perhaps vomiting; and by various other symptoms, indicating disease of the *stomach*, and not of the *heart*. In such cases, I have known persons seized with a violent pain, when they have moved quickly;—just the same as when there has been disease of the heart itself. The heart is certainly subject to pain of a neuralgic character. I have seen several cases of persons who have had violent pain, at different times, in the region of the heart; and the difference between it and what is called "angina pectoris," I have found to be this;—that the latter is only felt when the patient moves about; whereas a neuralgic pain is felt, quite as severely, when the patient is sitting still. Frequently, too, there is pain darting in other distinct nerves of the body. The pain is of a stabbing character; and although it may be made worse by the patient jolting himself about, yet when he is perfectly still, it will frequently come on in the most violent way. Another diagnostic mark is, that neuralgia is not particularly disposed to dart through the left arm; nor is it attended with a dying sensation;—as though the individual were about to expire.

With regard to the symptoms called "angina pectoris," I have relieved them more by prussic acid, than by any other remedy. If there be organic disease of the heart, you cannot relieve it to the same extent, as you can a *neuralgic* affection of the organ; and I do not know that I ever did much good in such cases.

ATROPHY OF THE HEART.

The heart will sometimes waste away,—be atrophied; and then it generally looks pale and wrinkled; and is compared by Laennec to

a shrivelled apple. You will frequently find this to be the case in phthisis; but occasionally it occurs independently of that complaint. You are not, however, justified in saying that the heart is *atrophied*, because it is *small*; for it may have contracted; and you find that the walls are thick, in proportion as the organ is small. I mentioned that the walls being thick, is not sufficient to warrant you in saying that there is hypertrophy; for in order to constitute hypertrophy, there should be no diminution of bulk, to counterbalance the increased thickness. So, on the other hand, there is no reason to say that the heart is *wasted*, because it is *small*; for in order to constitute atrophy, there must be no increase of thickness to counterbalance the diminution of the cavity. Occasionally, the heart does not become smaller, when it is wasted. The bulk remains the same externally; but all the walls have become thin. The cavity has increased, in proportion as the walls have become thin; but there has been no increase of the external surface. This is an instance of atrophy;—just the same as when the whole bulk has been lessened together.*

MISCELLANEOUS DISEASES OF THE HEART.

There are certain other structural affections of the heart, not to be known by any particular signs. I have seen the substance of the heart apparently changed into fat. I recollect opening an individual, in whom there was merely a thin layer of muscular substance on the outside of the heart, and within; and when we had cut through these, the rest was all fat. The individual had laboured under great difficulty of breathing, dropsy, and acute attacks of syncope. The heart was not able to do its duty. He was known, for many years, to have disease of the heart; but no one could imagine the real nature of the disease. Stagnation of blood took place in various parts; and there was dropsy and fainting. You will find a few other instances of this affection, recorded in the "Dublin Hospital Reports," and the "Edinburgh Medical and Surgical Journal." This is different to those cases where fat is deposited *outside* the heart; for here the heart, to a greater or less extent, is *replaced* by fat.

* "Sometimes the heart wastes,—is atrophied;—becoming small and wrinkled. This is often, though not always, observed after chronic diseases; and especially after phthisis. Pressure by a pericardial effusion, or any other cause, has the same effects. The walls of an atrophied heart (it is said by Dr. Bertin) may be either thicker or thinner than usual, or may be of their usual dimensions;—their thinness being occasioned by dilatation, and their thickness by narrowing of the cavities. But it appears to me that, if the walls are thickened, we are not justified in pronouncing the smallness of the heart an *atrophy*; for the external smallness of dimensions may arise from violent contraction at death; and, if the walls are dilated, that we are not justified in calling the thinness *atrophy*; because the original quantity of substance may be in them, and only spread out. If the whole heart weigh less than is natural, then only, I think, we ought to say that the organ is atrophied; and, even then, the smallness of the organ may be an original defect;—unless, indeed, it appear wrinkled, like a shrivelled apple,—to use Laennec's comparison."—*Elliotson on the Heart, page* 32.

Occasionally the heart is *scrofulous*. I have seen scrofulous tubercular matter in its substance. The heart is said (though I have never seen it) to be sometimes in a *cancerous* condition. It will sometimes contain *cysts*; and, they say, even true *hydatids*. Sometimes the heart has *melanotic* deposits; but I have never seen that affection.

I once opened a very curious case. There were small globular cysts, each containing bloody fluid, and attached, by peduncles, to the inner surface of the heart. They did not hang into the cavity; but were situated between the columnæ carneæ, and were seen pressing the ventricle out. It is a singular circumstance, that it occurred in the individual in whom, for the first time in my life,—before I had heard of such a thing,—I found what is called "pulmonary apoplexy."*

On opening a heart, you will often find a large coagulum of fibrin,—pure fibrin;—the red particles being altogether separated. These coagula are called, in common language,—or, at least, *were* called,—*polypi*. We do well to get rid of such absurd names. This fibrin was supposed to have existed during life, and to have indicated great disease; but it is now known to be merely fibrin, separated from the red particles of the blood. Occasionally, however, this does exist during life; and I presume the mode of distinguishing it, will be to observe whether the coagula are organized, and adherent or not, to the substance of the heart. If you see that these coagula of fibrin are organized,—really vascular, and adherent to the sides of the heart,—not merely sticking among the columnæ carneæ, but attached by real adhesions,—then you may suppose that they existed during life. Instances have occurred, in which the symptoms were decidedly referrible to these coagula; where the course of the blood was obstructed, without any one knowing the reason why; and where a bellows-sound was heard; but after death a coagulum of fibrin was found adherent,—perfectly united to the substance of the heart. I once met with an instance, where a large portion of fibrin was adherent to the mitral valve;—just in the same way as an adhesion will exist between the pulmonary and the costal pleura.†

You see, therefore, that there are a great number of organic diseases of the heart, which give no sign to the ear; but while you have

* "I gave the dissection," says Dr. Elliotson, "in the 'Annals of Medicine and Surgery' for 1816. Laennec, therefore, *erroneously*, considered himself the first who described what he terms 'the globular excrescence;' and, indeed, he refers to numerous authors, for what appear to have been analagous formations." This case, so important in many respects, will be found in the Appendix, No. XI.

† "Although the greater part of the fibrinous coagula observed in the heart and large vessels, are produced after death, some are unquestionably produced during life; for they are occasionally organic, and adhere by vessels to the substance of the heart; and symptoms appear during life, evidently arising from obstruction to the course of the blood;—exactly as we find to be the case from the existence of organized coagula in arteries and veins, at a distance from the heart. Sudden paralysis of an extremity, attended by loss of pulse in it, and sometimes at length even by mortification, has frequently occurred from the production of coagula in arteries."—*Elliotson on the Heart; page* 33.

no right to say that there is *not* organic disease of the heart, I do not know that you are justified, in any case, in saying that there *is*. There is no sign of *scrofula* of the heart,—no sign of *cancer*,—no sign of *abscesses* in it. A number of changes, of a structural nature, may take place in the heart, and yet give no sign that the ear can appreciate; and may only disturb the functions of the organ in such a way, that you are almost at a loss to say whether there is *functional* or *structural* disease. One is never justified in saying to any individual, that he has *not* structural disease of the heart. You may say that the symptoms you observe do not *indicate* it; and you may say that *such* and *such* a structural disease does not exist; but you cannot affirm that there is no structural disease whatever.*

ANEURISM OF THE AORTA.

There is disease of another part which it is right to mention, as a part of the heart. It is situated in the chest, and is an affection of the ascending aorta,—particularly of the arch. These are parts which are very frequently diseased; and we have continually to make

* "Like various other parts of the body, the heart is subject to neuralgia. I had a case of this kind, where the pain was intense;—affecting not only the region of the heart; but darting to the shoulders and back;—sometimes dull and aching; at others, stabbing. It was not increased by motion or posture; and was unaccompanied by any stethoscopic signs. It occurred in a middle-aged woman at the Hospital [St. Thomas's]; and the symptoms were removed by iron; but afterwards, I believe, returned. A second case has occurred to me, in the person of a lady, who appears to have laboured under the disease very many years. Besides a constant aching in the lower part of the cardiac region, near the sternum, there are frequent stabbing pains,—plunging (to use the expression of most persons afflicted with neuralgia); so that she is compelled to rise and walk the room almost every night. These pains occur during both rest and motion; but most severely during motion. They shoot in all directions; and occasionally occur in distant nerves. As soon as they are over, she is apparently well; and, when they are not very troublesome, sings, dances, or takes horse-exercise. In the first case, the ear discovered nothing morbid in the heart. In this, a slight ventricular bellows-sound is heard. Andral mentions a dreadful case of this kind, which proved fatal, without leaving any trace of disease in the heart, or its dependencies.

"Upon the state of the heart which gives rise to a mixture of the venous and arterial blood,—the state termed *cyanosis*,—I have little to say. It is usually a congenital malformation; upon which subject the works of Dr. Farre and Mr. Burns together, leave nothing to be desired. I have seen the admixture rather suddenly begin to increase in adult age. Bertin believes that the admixture has occasionally commenced after birth, from an ulcer in the auricular or ventricular septum,—throwing the two corresponding cavities into one. In most cases, the right auriculo-ventricular, or ventricular-arterial opening, becomes narrowed; and the right auricle, or ventricle, or both, are dilated and hypertrophied; and the usual ill consequences of that affection are, sooner or later, experienced.

"Preternatural situation of the heart occasionally occurs;—sometimes congenitally, but oftener in consequence of the morbid presence of solid, liquid, or aeriform substances in the left cavity of the thorax,—pushing the heart to the right. The circumstance is by no means uncommon. Dr. Abercrombie mentions a case, in which the right lung had become solid; and the left, dilated extensively to perform the function of both, had pushed the heart to the right. Increased bulk of the heart itself, or pressure from other parts,—either above (as aortic aneurism), or abdominal enlargement below,—will likewise occasion other changes in the situation or direction of the heart."—*Elliotson on the Heart; page* 33.

a diagnosis between affections of them, and of the heart. The most common disease of the aorta, is aneurism, or dilatation. We continually find, on opening bodies, that while there is disease of the heart itself, there is disease of the aorta.* The inner surface is rough,—perhaps studded with a yellow opaque substance,—perhaps with bone; and frequently the inner coat is destroyed, here and there; so that there is rough bone, which the blood passes over. When a inner coat is destroyed, an appearance very much like ulceration is seen. You will sometimes see the inner surface of the aorta rough, like the bark of a tree.† There is no sign which will indicate this affection. It rarely exists alone; but is generally found united with disease of the left ventricle. Disease of the left ventricle will, however, exist without it; and it may take place independently of disease of the left ventricle.‡

The aorta, where it arises from the heart, is frequently dilated; and besides being dilated, it is frequently distended, at one spot or more, into a pouch; so that an aneurism exists. There is seldom an aneurism of the ascending aorta, without a dilatation;—that is to say, the whole circumference of the ascending aorta dilates in the

* "The lining membrane of the heart and aorta, is subject to inflammation; and sometimes simultaneously with the pericardium. In the case of the heart, I believe that the symptoms are increased general sound, force and frequency of action, with more or less pain or uneasiness. When the former symptoms continue for a length of time, without the peculiar auscultatory signs of organic disease, or proportionate pain on pressure, as observed in pericarditis,—we certainly may infer the existence of this inflammation. The lining membrane of the aorta is generally inflamed at the same time; and, when the affection extends along the descending portion, there is frequently a sense of smarting in the direction of the spine; together with a violent pulsation in the abdomen, not only of the aorta, but even of the iliacs; without any perceptible enlargement of the vessels, the existence of any tumour in the neighbourhood of the aorta, or such a smallness of any of the arteries, as might render it probable that the aorta was narrowed in any part, and thus forced into violent pulsation."—*Elliotson on the Heart; page* 33.

† "Of the intensely bright redness of the inner surface of the inflamed aorta, and the impossibility of ascribing it to anything but inflammation, I have elsewhere spoken; as well as of the occasional effusion of fibrin. It appears as a red stain; and sometimes the middle coat appears more loaded with blood than usual. But we far more frequently discover the *chronic* change of structure in this vessel; yellow spots are seen every day. Often a yellow curdy substance can be squeezed through the inner membrane under which it is deposited;—the membrane having become friable, and under distension giving it issue. Sometimes the deposition projects into the canal of the artery, like a tubercle. Frequently spots and patches of bone are seen here, and in contact with the blood. This bone I believe to have been originally deposited beneath the inner membrane; and to have become exposed by the cracking and destruction of this membrane. Sometimes all the coats are thickened and indurated. Ulceration is occasionally seen; and fatal hæmorrhage has thus been produced;—the attenuated outer coat (perhaps the only one remaining) giving way under some exertion, or strong action of the heart."—*Elliotson on the Heart; pages* 33 *and* 34.

‡ "Aortitis seems caused by all the circumstances which produce inflammatory affections of the heart, and perhaps by disease of the heart itself. Either hypertrophy of the left ventricle gives rise to inflammation of the aorta, or the converse happens, or they spring up together; for they are frequently conjoined."—*Elliotson on the Heart; page* 33.

first place; and then, in the midst of the dilated vessel, you see at one spot a pouch formed. Aneurism very rarely affects the ascending aorta, without the vessel having been first dilated.

Aneurism of the ascending aorta frequently exists without people being aware of it. They will fall down dead in a moment, as if they were shot;—nobody imagining what is the matter; and at the autopsy, the aorta in found ruptured into the pericardium. I had a striking instance of this, in a woman who came into the hospital with a pain (which appeared to be rheumatic) in the neck, face, and shoulder. Leeches were being applied; she shrieked, fell back, and was dead in a few minutes. On opening her, I found that the pericardium was filled with blood. In these cases, on cutting the pericardium, out flows a quantity of bloody serum. After that, you find a coagulum of blood; and then you observe a fissure in the aorta;—first passing through the pericardium reflected over the vessel, and then through the coats of the vessel itself. This fissure is generally transverse. In the case just mentioned, the inner and the middle coats had given way, some time before. A great quantity of blood was effused; the coagulum was organized; and, as in common aneurism, it pushed out the external coat; which suddenly cracked, and she instantly expired. It very often happens, as I have mentioned, that patients die of rupture of the aorta into the pericardium, without the patient knowing previously that there is anything at all the matter; but if the disease be situated a little higher than that, then you have certain symptoms induced.

Supposing that the disease is situated in the ascending aorta, after the vessel has left the pericardium, the patient then frequently complains of pain at that particular spot; and on listening, you hear a certain loud sound at the stroke of the heart,—at the time of the pulse; and this long before it has produced a tumor. When the aneurism has attained a certain size, it generally produces a tumor on the right side;—about the fifth or sixth ribs. The symptoms of disease of the *heart*, are at the sternum on the *left* side; but in the case of the ascending *aorta*, they occur on the *right* side. If the disease be situated higher up still,—in the arch itself, you have the tumor in the situation of the third or fourth ribs. If it occur in the superior part of the arch, then you have the tumor above the sternum at the clavicle. Now, when there is a tumor, it pulsates very strongly; and there are general symptoms. There is frequently cough, frequently mucous and bloody expectoration, and sometimes difficulty of breathing. The dyspnœa is sometimes so great, that the person cannot lie down; and sometimes there is difficulty of swallowing. If it so happen that the œsophagus is pressed upon, the compression is frequently such, that it produces spasmodic asthma. You have pain at the right shoulder, pain down the right arm, and pain at the right side of the head. In these circumstances, there can be no doubt whatever as to the nature of the disease.

I have been able to discover this affection, by hearing a loud sound in these parts. Bertin said it could be discovered; but Laennec

said it could not. Bertin replied, however, that Laennec did not apply the stethoscope in the right place;—that he should have applied it over the sternum; and that then, in the incipient stage, he would have heard a loud sound. I certainly have heard, at that part, a loud sound,—louder than at the heart itself; and when the patient has had difficulty of breathing and cough,—such symptoms as might arise from aneurism,—I have suspected aneurism of the arch of the aorta, before there has been an external tumor. The other day I had a case, in which I was able to verify the diagnosis. But then I had something more to guide me; for there was a tumor; so that it was clear there was some disease in that quarter. I did not pretend to be very sagacious, therefore, in making out that the arch was dilated. If, however, there be no tumor, so that there is nothing to guide you but the ear, I should think the diagnosis would not be very certain. Occasionally you hear a bellows-sound;—just as in aneurism of other parts. Sometimes you have a double sound;—exactly as in the case of the heart; and for this reason;—you hear the sound of the *heart*, and also the peculiar sound of the *aneurism*.*

As to the *treatment* of a case of this description, nothing can be done but to enjoin perfect rest, and deprive the patient of all stimuli;—giving him that nourishment which is least likely to quicken the pulse. Bleeding, from time to time, is exceedingly useful. You

* For additional particulars respecting the Morbid Sounds of the Heart, see Appendix, No. XII. We cannot take leave of Diseases of the Heart, without directing the particular attention of our readers to Dr. Elliotson's splendid work on that subject,—already so frequently quoted. It consists of three lectures; the first of which is devoted to Diseases of the *External* Membrane of the Heart; the second to Diseases of the *Internal* Membrane of the Heart; and the third to Diseases of the *Substance* of the Heart and of the Aorta. The following passage developes the Doctor's views of pathological investigations; and we quote it the more readily, as it contains an authentic list of his publications:—"Experimental facts, however insulated they may at first appear, gradually arrange themselves with others into general principles; and thus, what is at first little better than *empiricism*, becomes *science*. I confess that I look to this source of improvement with more hope, than to any other. To such investigations, therefore, I have sedulously applied myself; and those of my results which were successful, are before the profession:—'Cases illustrative of the Efficacy of Hydrocyanic Acid, in Affections of the Stomach; with a General Report on its Medical Powers;—Some Facts respecting the Use of Opium in Diabetes; and the Necessity of varying the Doses of Medicine, in various Circumstances (8vo. 1820).'—'On the Medical Properties of Quinine.'—'On the Use of the Subcarbonate of Iron in Chorea, and its General Properties.'—'On the Use of Subcarbonate of Iron in Tetanus.'—'On the Use of the Sulphate of Copper in Chronic Diarrhœa.' All these four papers, together with three of a pathological nature, were published in the twelfth, thirteenth, fifteenth, and sixteenth volumes of the 'Medico-Chirurgical Transactions.' The pathological papers are on,—'Rupture of the Stomach;'—'Fallopian-Tube Pregnancy;'—and the 'Communication of Glanders from the Horse to the Human Subject.' I make this statement for the purpose of easy reference; as some of my friends wish me to collect these,—the whole of my professional attempts, except the English Edition of Blumenbach's 'Physiology,' and an Introductory Lecture upon State-Medicine,—into one volume; and I feel disinclined to follow their advice."

This disinclination we regret; as we are persuaded that the volume here pointed out, illustrated by such notes as the progress of medical science, and the author's recent experience may dictate, would be an acceptable present to the profession.

will find that you relieve the sufferings of the patient exceedingly, by bleeding him. You know that, in aneurism, nature fortifies the part, by producing adhesions around it; but there is frequently more inflammation than is useful; and there are frequently pricking, stabbing pains, together with violence of the heart's action; and all these are diminished by bleeding. You will find the blood buffy and cupped, in such cases; because there is inflammation going on. It is of the greatest use to bleed from time to time; and to keep the patient low and quiet. These are not cases to be neglected. We may not be able to save life; but we may diminish the pain very much.

PERITONITIS.

The first disease of which I shall speak, after passing the diaphragm, is inflammation of the peritoneum;—*peritonitis.* This disease is, of course, attended by pyrexia,—general feverishness. Although the whole body is hot, yet generally the abdomen is hotter than other parts. The pulse is, for the most part, rather small. Of course, it is quick; sometimes it is wiry; sometimes it is hard; and sometimes it is soft. There is no invariable pulse in peritonitis, with the exception that it is always quick. More frequently it is small than full; and perhaps more frequently rather hard than soft. There is a great variety as to the appearance of the tongue. Sometimes it is really pretty clean,—at the utmost only whitish; sometimes it is covered with a thick, creamy mucus; and sometimes it is rather dry. You have no very great index to the disease, either in the appearance of the tongue, or in the character of the pulse; but the abdomen is always very tender on pressure; and the tenderness is too general for one to suppose that any particular organ is inflamed. One of the modes of distinguishing peritonitis from inflammation of a particular organ, is by observing that the tenderness of the abdomen is not in the seat of any particular organ whatever; but is more or less general. As the peritoneum stretches all over the abdomen (being named from *περιτεινω, to stretch over*), and usually a great proportion of it is inflamed, the patient is most frequently easier on his back, than in any other position; and sometimes, to obtain all the ease possible, the patient lies with his knees spontaneously raised. In general, patients cannot sit up, on account of the abdominal viscera gravitating so much as to produce painful distention; and therefore they are easiest in a lying posture. Besides the tenderness, there are very frequently pricking pains of the abdomen,—as if needles were running into different parts; and occasionally there is a sharp, cutting pain. The abdomen is usually very tense. As it is a mere membrane that is inflamed, the bowels are in general not particularly disturbed. They are regular, or at the utmost only slightly confined; and are easily opened. There is no obstinate constipation.

Although the inflammation is generally very general, yet it may rage more severely at one spot than at another. Consequently there is more pain at one part than at another; and if that part be situated

over any particular organ, then you have the function of that organ more or less disturbed. If, for example, at any particular period of the disease, the membrane covering the stomach be inflamed, you have vomiting induced;—if it be the portion which covers the bladder,—and which is only a partial covering, as you know,—then there may be very great irritation of the urinary organs. In the former case you have vomiting; in the latter, strangury. As the inflammation spreads, it attacks one part after another. It is the peritoneum at large that is inflamed; and therefore the tenderness is general, and the pain diffused; and any disturbance of function that exists in the abdominal viscera, is trifling in proportion to the general pain and uneasiness. It is in this way that you distinguish it from inflammation of any particular organ.

This disease, when acute, may last about a week before it proves fatal; but if it remit, it may of course last much longer.

After death, the appearances found are nothing but those which are usual in inflammation of a serous membrane;—for example, a quantity of serum of a whey-colour, more or less turbid, with flakes of fibrin. It is rare to find the serum bloody. The fibrin is frequently effused in a gelatinous form, both in the parietal and visceral portions; and perhaps adhesions are thrown out, so that there are bands. Now and then the secretions resembles pus; and now and then it is *really* pus. As to the redness of the peritoneum, that may be either in little stars,—a collection of red points, or diffused in patches. The peritoneum, like most other serous membranes, becomes rather thicker than usual. It is not so translucent as in health; and, now and then, it is exceedingly pulpy. When the peritoneum covering the alimentary canal is inflamed, the redness will sometimes spread inwards, even to the villous coat; but it is very rare to find inflammation of the parietal portion spread outwards, towards the abdominal muscles. When the portion covering any particular organ is inflamed, you may find the organ itself affected; as, for example, the omentum or the mesentery; so that you may have *omentitis*, or *mesenteritis*, or any other *itis* you may choose to manufacture out of the name of the organ, and the termination "*itis*" added to it.

This disease very often occurs in a puerperal state; and by some it is thought occasionally to be contagious. It is called, when occurring in that state, *puerperal fever*. Sometimes it will take place immediately after delivery; and sometimes many days afterwards,—whether the patient is sickly or not; and, on the other hand, it will sometimes take place during the latter period of pregnancy. Whether it be a contagious fever or not, it certainly is very often epidemic; and one might say *endemic*; for this disease (puerperal peritonitis) frequently prevails to a great extent at a particular period; and sometimes it prevails only in particular districts.*

* The reader is recommended to consult, on this subject,—"A Treatise on the Disease termed Puerperal Fever; illustrated by numerous Cases and Dissections. By John Mackintosh, M.D."

Peritonitis is very frequently a cause of death in cancer of the womb, or various other diseases of the uterus, or of the ovaries. Whenever cancerous or other ulceration occurs in these parts, and exists for some time, the peritoneum around the ulceration comes to be inflamed; so that peritonitis is a common termination of organic diseases of these parts. Peritonitis sometimes occurs, also, after a rupture of the stomach or intestines, from ulceration. Of course you are aware that it sometimes takes place from a hernia,—either from the operation for it, or the hernia itself,—from an operation for stone, from paracentesis abdominis, and so on. It will arise from any wound, or a mechanical injury of any sort, inflicted on the abdomen. It is frequently consequent upon the application of cold; and especially cold and moisture applied when the body is overheated;—just the same as any other inflammation.

The *treatment* of the disease is easy enough. It consists of general bleeding, followed by an abundance of *local* bleeding, by means of leeches), a rapid affection of the mouth by mercury, and keeping the bowels well purged the whole time, cupping would produce great pain. Some prefer fomentations, and others blisters. Perhaps, it is not a matter of importance which you apply; but if you have bled as much as you dare, and still want to do more, then blisters will be the great point of treatment. Some have recommended the external application of cold to the abdomen, in such a case; but I have never employed it.

In that form of the disease which occurs in connexion with pregnancy, or the puerperal state, it is found that a great variety of treatment is necessary. You may have cases where there is active inflammation, demanding a vigorous antiphlogistic treatment;—such as I have now mentioned; whereas, in others, the very utmost that can be borne is the application of leeches. Patients are seized with more or less pain in the abdomen; but you find that the pulse is feeble; and if you bleed them, they will certainly sink so much the sooner. All you can do, therefore, is to apply a few leeches, give a moderate quantity of mercury, and exhibit opium freely. So slight is the inflammation, in some of these cases, and so great the loss of power, that after death the peritoneum is not found red, but rather pale; and it will have very soft lymph lying upon it;—shewing that there was an inflammatory state, but that it was attended with extreme weakness. Where you find that the pulse is feeble, and the patient's countenance expressive of great debility, opium is by far more suitable than bleeding; but if the tenderness seem to indicate bleeding, a few leeches would be all that was proper. In such a case as this, even purging has been found to be too severe a measure; but there can be no objection to a moderate quantity of mercury;—using such a preparation as will not produce an affection of the bowels (Hydrargyrum cum Creta for instance). The application of warmth and moisture, will be found very serviceable. Dr. Gooch, who (as far as I can observe) has treated the subject well, strongly recommends the application of bran, moistened with hot water, and placed

between two pieces of linen. A bran-poultice appears to afford very great relief.

You see, therefore, that the peritoneum may occasionally be in an inflammatory state, attended with such extreme weakness, that the common remedies for inflammation can hardly be put into practice. This is somewhat analogous to what I mentioned respecting hydrocephalus;—that occasionally children have all the marks of that complaint, and yet no signs of inflammation are observed after death. In the case before us, however, the membrane is inflamed, but the debility is out of all proportion to the inflammation. You perceive that the treatment of peritonitis connected with the puerperal state, especially after delivery, requires to be much varied.

Inflammation of the peritoneum is very frequently a *chronic* affection; and in that case there is pain on pressure;—that is to say, there is tenderness, and likewise pricking pain. There is almost always a feeling of tension; and sometimes that is more complained of than the pain itself; but there is not necessarily any tension to be discovered; for sometimes the integuments are quite flexible. Of course there is pyrexia. The pulse is constantly quick; there is more or less thirst; the skin is generally more or less dry; the tongue is foul, and either white or yellow towards the back. The breath, in this disease, is very frequently fœtid; the face sometimes assumes a doughy aspect; the bowels generally are torpid; and frequently there is ascites, from the chronic inflammation of the membrane causing an excessive secretion. As the inflammation is of a chronic character, of course you may presume that the body wastes. The internal functions are very much deranged. The stools are very copious, and generally of a white-brownish colour;—not being so fully impregnated with bile as they should be; and the mesenteric glands are frequently diseased. In fact, when chronic peritonitis occurs in young persons, it is, for the most part, a scrofulous disease; and is connected with more or less affection of the mesenteric glands. After death, you may find excessive redness and thickness of the membrane; and an effusion of serum and fibrin.

The *treatment* of the disease consists in the frequent application of leeches; the frequent use of the warm bath, general or partial; warm applications,—such as the bran-poultice I mentioned, applied constantly day and night; or, as some have recommended, *cold* applications, frequent blisters, and a regular purging with calomel. The contents of the intestines are very abundant. Of course the diet should be mild. After the disease has lasted some time, if there be no very great excitement, you may try mild tonics;—the mildest form of iron, for instance; but during the greater period of the disease, antiphlogistic measures, mildly carried on, constitute a preferable mode of treatment.

ENLARGEMENT OF THE MESENTERIC GLANDS.

If, along with chronic peritonitis, the mesenteric glands are enlarged,—or if, indeed, they are enlarged *without* that affection,—you may or you may not have a tumor. The mesenteric glands are frequently much diseased, without producing a tumor; yet they are sometimes so diseased, that you find a general hardening of the abdomen. When peritonitis exists, in the greater number of cases, you can only infer disease of the mesenteric glands from the scrofulous look of the patient, from his wasting away, and from there being something more than what chronic inflammation of the peritoneum can produce. When there is tumefaction from disease of the mesenteric glands, frequently a great deal of it is from flatulence; so that if you strike with the fingers, you have a very considerable sound. Sometimes tubercular substance is deposited in the peritoneum itself; so that besides chronic peritonitis, you have scrofula of the peritoneum. It is by no means easy to make out the exact nature of such a case as this. It is pretty clear that there is peritonitis, and that there is likewise scrofula; but whether there are tumors or not, or whether the disease affects the mesenteric glands, or the peritoneum itself, is not always an easy matter to decide; nor is it of any consequence.

Occasionally the mesenteric glands acquire a very large size; and before that, there is a great sense of dragging in some particular direction. In those cases which are very bad, and where there is scrofula in the abdomen at the same time, there is great emaciation, together with sallowness of the complexion,—sometimes a sort of marble-white; and a hectic flush on the cheek,—at any rate, at certain parts of the day. The eyes look clear and glazed. Occasionally, in the course of the day, there is deep lancinating pain in some parts of the abdomen. The stools are generally abundant;—foul, frothy, and imperfectly tinged with bile. Occasionally there is great disturbance of the stomach; so that patients complain of a burning sensation in that organ. The lips frequently swell; are of a deep red colour; and crack, from ulceration in the corners. There is also feverishness. Although the pulse is constantly quick, yet there are exacebations. When the patient does sweat on falling asleep, the skin is frequently quite dry. The emaciation, in these cases, is often extreme; and you frequently see the ends of the fingers enlarged;—exactly as in phthisis.

These are the general symptoms of scrofula of the mesenteric glands, and of peritonitis. The symptoms are always much more severe, and the emaciation is greater, than in simple inflammation of the peritoneum; but still it is often difficult to say whether the latter affection exists alone, or whether the two complaints are united. It is only by finding that the disease is inveterate,—that it will not give way to common antiphlogistic measures, that you begin to suspect, at last, that there must be something more than inflammation of the peritoneum. Occasionally it is not so much the *mesenteric*,

as the *lymphatic* glands that are diseased;—particularly the glands of the loins. All these affections occur more frequently in children, than in adults; but you see them occasionally in the latter.

If the mass of tubercular substance be very great, it may produce peculiar effects, by its pressure on various parts. From pressure on the ureters, you may have more or less suppression of urine; by pressure on the gall ducts, you may have jaundice; and by pressure on the pylorus, you may have vomiting. Some have supposed, that when the mesenteric glands are enlarged, the emaciation is the consequence of the chyle being interrupted in its course; but even if the chyle be not obstructed, the scrofulous disease is sufficient to account for the wasting of the body. In fact, some experimentors say that they have always found an injection pass freely through the absorbent glands, although they were enlarged in various degrees. Many have asserted this.

When you see a disease of this description,—when you suspect that, besides chronic inflammation of the peritoneum, there must be something more, from the disease not giving way to ordinary treatment,—to the application of moisture, warmth, and steady purging; or moderate purging, local bleeding, and similar things,—it may be right to exhibit iodine in its various forms; and if you can discover a tumor in any part, or any general hardness of the abdomen, so as to make it probable that the mesenteric glands are enlarged, it may be given from the first. We should also rub in iodine, in the form of hydriodate of potass, as the patient can bear it; but there is frequently too much pain for it to be borne at all. The hydriodate of potass will often be borne, when the iodine itself cannot. But these are very unsatisfactory cases to treat; and frequently all that we can do, is to send people from the unhealthy situation in which they may reside, to the fresh air. The havoc which is found in these cases, is sometimes dreadful. You may see the whole of the intestines glued together. Sometimes you will see ulceration of the peritoneum itself;—the intestines within being sound. Occasionally the ulceration makes the peritoneum quite thin. It even ulcerates through; and then you find ulceration of the intestines, and chronic inflammation of the mucous membrane of the intestines, and of the lacteal glands. Frequently the lumbar and dorsal glands, are all in a state of enlargement and suppuration; so that there is extreme suffering, and the most decided hectic before death; and, after it you certainly have the most frightful spectacle that can be seen in Morbid Anatomy. This is entirely a scrofulous affection.

ASCITES.

Sometimes, although the chronic inflammation of the peritoneum is very inconsiderable, yet the effusion is exceedingly great. Sometimes, indeed, there is scarcely any mark of inflammation to be found; but you have a structural change of the peritoneum, and a great deposition of water. The peritoneum becomes thick, and assumes a satin-whiteness. In fact, it looks like a piece of satin ribbon; so

that you may doubt whether you can call its state inflammation or not; but it is of an inflammatory nature. When this effusion is very considerable, we call the disease *ascites* (from ασκος, *a large abdomen*).

When ascites is not the result of acute or decided inflammation, you will find in most cases that there are marks of structural change; and some ascribe it to disease of the liver;—so frequently is that organ affected at the same time. Where, however, the peritoneum is diseased, you will find the portion covering the liver very thick, quite white, and opaque; and I believe that ascites does not arise from disease of the liver, but from a structural change in the peritoneum itself. Some ascribe it to an obstruction in the liver or spleen. An obstruction may exist in those organs; but if the ascites arose from that source, it is very odd that we do not find all the veins enlarged, —very odd that there is no effusion into the intestines, a varicose state of all the veins, and things of that description. I have seldom opened a case of ascites, in which the liver was not diseased, in some part or other.

Dropsy of the peritoneum is characterized by a fluctuating and elastic equable tumefaction of the abdomen. At first it only inconveniences a patient when he is sitting upright, and fluctuation is discovered only at a certain point; but as the disease extends, the tumefaction becomes universal. The best mode of discovering the fluctuation, is to place the hand against one part of the abdomen, and then to give a gentle tap with the fingers on another. Occasionally the integuments, or the peritoneum, are very much thickened; and it is then necessary to give a good *sharp* tap; but, for the most part, a very *gentle* tap will lead you to feel the fluctuation. You will sometimes not find the fluctuation throughout; and occasionally the peritoneum differs in thickness at various parts; so that it is necessary to tap from above downwards, and in various ways. There is in general, as in most other dropsies, very little urine; but however much the abdomen may be distended, there is generally little dyspnœa, so long as the chest remains free. So long as there is not disease of the heart, or pleuritis, or bronchitis, it is surprising how well patients will breathe with a very large abdomen. The tumefaction begins, of course, in the lowest part; and gradually ascends, till the whole abdomen is distended.

If the disease be the mere effect of acute inflammation, subdue that, and the dropsy will cease; but when it does not arise from that source, or is not the result of any discoverable inflammation, the prognosis is generally bad; and more especially if you can discover disease of any of the abdominal viscera.

This affection, after a time, is followed by œdema of the legs; but sometimes the latter takes place first; and the ascites is nothing more than the result of a general tendency of the cellular membrane of the body, and serous membranes, to secrete fluid. But where there is not this general disposition to dropsy, and its occurrence in the abdomen is a local disease, the legs swell last, and frequently this does not take place for a length of time. You recollect that

Shakspeare describes Falstaff as having a *decrease* of the *legs*, and an *increase* of the *belly*.* The fluid that you find after death, or which you let out, is generally yellow and glutinous; and the longer the disease lasts, and the more frequently the patient is attacked, the darker it generally becomes, and the worse becomes the case itself; because the peritoneum falls more or less into disease, and perhaps becomes quite soft.

The *treatment* of the disease must depend, in the first place, on the fact of there being any inflammation or not. If you discover inflammation, generally speaking, you have merely to treat that; but if you find no inflammation at all, but simply a swelling of the abdomen, you will frequently get rid of it by purging the patient briskly with elaterium, or any other hydragogue purgative;—such as jalap, or cream of tartar. Elaterium is better than all other things; and patients will take it for a considerable time, every day, or every other day. It is necessary, however, to begin the dose very carefully; for one person will not bear above a quarter of a grain, whereas I have given others five ar six grains. Much depends upon the preparation; for nothing is more adulterated than elaterium. Some houses prepare it very carefully, and some very badly; but when you have a tolerably good preparation, you should give a quarter of a grain, and ascertain how far it and the person to whom you give it agree together. If you give a grain at first, it may produce such violent vomiting and purging, as to cause great distress. Some patients will bear the dose increased to five grains; but generally the average quantity is from half a grain to a grain and a half. While you exhibit this every day, or every other day, it will be good practice to support the patient with wine; so that while you drain him well, you make him some sort of amends for it. It is astonishing how much fluid may be got away; and while there is no rule for the dose, yet the object is to discharge as much liquid from the alimentary canal as possible,—according to the patient's strength.

Purgatives are certainly among the best means, you can employ. Neither leeches nor blisters do much good. If you can ascertain that there is organic disease of any sort, you may give mercury, iodine, and things of that description; but frequently, with all these, you do not succeed; and you are obliged to tap the patient. I do not know that there is any harm in tapping early. On the contrary, it may be of great use in preventing the parts from becoming so stretched, that they will not contract again. Others have thought the same; but I have not a series of cases treated on each plan. It is a fact with respect to dropsy of the ovaries, that the more you tap, the more harm you do. The sooner you tap the patient, the

* *Sir John Falstaff.* You that are old, consider not the capacities of us that are young.

Lord Chief Justice. Do you set down your name in the scroll of youth, that are written down "old," with all the characters of age? Have you not a moist eye, a dry hand, a yellow cheek, a white beard, a *decreasing leg*, an *increasing belly*?

King Henry the Fourth; Act I, Scene 2.

sooner must she be tapped again. There is no doubt but that, in ovarian dropsy, the greater the length of time you can postpone the operation, the longer you may still put it off; but this is not the case in dropsy of the peritoneum.

If you choose to treat the disease with diuretics,—which is frequently a good practice,—squills, digitalis, and mercury, answer exceedingly well. This is not so certain a practice as treating the case by hydragogues, which are also diuretics. If you adopt it, you will frequently find that the kidneys will not act; and yet if you tap the patient, they will act directly. It is common, when the abdomen is in a state of great distention, for the kidneys to refuse to secrete; but if you take off the tension, the patient will make a great quantity of water. You will observe this, whether patients are taking diuretics or not. It is always a useful plan, when the water is diminishing, to have the abdomen well bandaged; or to have a thin belt, producing equal pressure thorughout. You will find this apparently of very great use.

As to the mode of operating, and the part to be selected for the purpose, I need not say any thing on that subject. It would be well, however, before you propose the operation to a surgeon, carefully to ascertain whether the disease exists;—to ascertain, not merely that there is fluctuation, but fluctuation from a collection of water in the peritoneum; because the urinary bladder will occasionally become enormously distended. I have seen it so distended, that the person has been supposed to have ascites; but on drawing off the urine, the ascites entirely disappeared. This disease sometimes co-exists with pregnancy; and pregnant women have been tapped for ascites with success. Sometimes it will co-exist with a diseased ovary. I have known instances where the ovary was as large as a child's head; and where, in addition to that, there was ascites all around it.

ORGANIC DISEASES OF THE PERITONEUM.

The peritoneum is subject to some other diseases;—such as to become cartilaginous, to become bony; and to have hydatids, or scirrhus, or fatty tumors deposited in it. The same applies to the omentum.

DISEASES OF THE ABDOMINAL GLANDS.

The lymphatic glands within the abdomen, besides being subject to the disease I have mentioned (scrofula*), are sometimes found after death to have become indurated,—almost changed to cartilage; and to have suppurated, independently of all scrofula;—to have pus collected in them, in small quantities, or in drops. These glands are also subject to melanosis, to scirrhus, and to the formation of earthy concretions; and so likewise are the *mesenteric* glands; but

* From "scrofa,"—*a sow*;—swine being considered to be particularly subject to the disease.

you cannot make out the real nature of the affection, till after death. When the inner surface of the intestines is much diseased, you are almost sure to find the mesenteric glands also affected. When there is scirrhus, or cancer of the intestines, all the neighbouring glands, lacteals, and absorbents, are commonly enlarged, and labouring under the same disease. But you cannot discover this during life; unless, by chance, some particular tumor is produced.

CYSTS IN THE ABDOMEN.

The peritoneum, (or, at least, the sub-peritoneal cellular membrane), is likewise subject to the formation of cysts. Occasionally cysts are found in other organs, projecting into the peritoneum. Sometimes the ovaries will become dropsical;—cysts being formed in them. Occasionally large cysts are attached to the concave surface of the liver,—sometimes to the centre, and in other instances to the side. Besides general dropsy of the peritoneum, therefore, you frequently have large serous cysts. In these cases the tumor is not general, but local;—does not occur at the lower part particularly, but may take place any where in the abdominal region. It usually occurs at one side, in the first instance, and arises from one of the ovaria. You will find that the fluctuation is local. Though the tumor most frequently arises from the ovaria, yet I have seen a large cyst at the epigastrium, attached to the liver. Now and then there are small cysts attached to the spleen; and, at last, the tumor will become so excessively large, that it is impossible to say whether there is ascites or not. The whole peritoneum will become filled. So again, with respect to the ovaries, you may not be able to say whether there is ovarian dropsy or not.

DROPSY OF THE OVARIES.

It is surprising to see how much water is sometimes collected, in cases of ovarian dropsy. I once saw an old woman, who had had the disease many years, and never would be tapped. She was of an immense size; and at last grew so big, that a certain quantity of water was let out; and we found that it amounted to eighty-four pints. The diaphragm had been pushed up to the fourth rib; the chest was exceedingly small; but the size of the abdomen was immense. That, however, was nothing to what other people have seen. M. Chevalier says, that he once saw one hundred and thirty-six pints removed;—all of which must have existed at once. You will find the case in the third volume of the "Medico-Chirurgical Transactions." It was drawn off at three or four times. The health, in these instances, is not affected, as it is in dropsy of the peritoneum; so that a woman at Paris lived to be tapped three hundred times. Another woman was tapped one hundred and fifty-four times. In the course of that period she had three children; and was tapped two or three times during each pregnancy; so that she lost no time, but went on bearing children and water too. At least twenty pints were removed at each time; and she was tapped, at various periods, during twenty

years. There is another case recorded, where six thousand six hundred and thirty-one pints were taken away. It was not all removed at once; but was drawn off at eighty operations, performed in the course of twenty-five years;—so long do women sometimes live in this affection. I suppose they kept a very accurate account. In one year this woman had four hundred and ninety-five pints taken away. The case is mentioned by Dr. Mortimer, in the "Philosophical Transactions." There is an account, by a celebrated French surgeon, of a case where four hundred and twenty-seven pints were taken away in ten months. A case is mentioned by Mr. Carruthers, in his work on Inflammation, where a woman was tapped nineteen times in three years. A German author mentions an instance, where a person was tapped one hundred and forty-three times. Only two years ago, an advertisement appeared of a woman who wished people to go and see her (and pay for it, I presume); and who stated that she had been tapped one hundred and twelve times, and had had two thousand eight hundred and eighty-eight pints taken away from her. She came from Chepstow. I had not time to see her; but she had the certificate of a medical man, stating that he had performed one hundred and twelve operations, and had removed two thousand eight hundred and eighty-eight pints. Whether the case is true or not, is of little consequence; because, without doubt, great quantities have been taken away. It is no matter whether exactly six thousand six hundred and thirty-one pints were drawn off,—as mentioned in one of the foregoing cases. Five thousand will do very well to illustrate the fact, that people in this disease will live very long, suffer an immense secretion of water, and bear the operation of tapping an extraordinary number of times.

The fluid, in ovarian dropsy, is often exceedingly greasy; so that you will find on the surface a quantity of irridescent, or at least whitish shining matter; which, if rubbed in the fingers, will form an unctuous mass. I have collected it; and found that it would melt and burn, like any waxy matter. It emits a bright flame, and is insoluble in water. Dr. Bostock mentions, in the fifteenth volume of the "Medico-Chirurgical Transactions," that in a case of very old hydrocele, he found the serum mixed with a portion of this unctuous substance. He conceives it to result from a change which the fluid has undergone, subsequently to its original deposition. In order, however, for that to have taken place, it must have been of very long standing. He found it to be analogous to that greasy unctious matter, which is called *adipocire*. He terms it "albuminoserous matter;" and says it is distinct from cholesterine. It is not the same as that which is found in the liver, the urine, and certain biliary calculi; though it is of an analogous nature. Something like this has sometimes been found in the thyroid gland, and in the fluid of various tumors. You will find some chemical observations upon it, in the volume to which I have referred.

In dropsy of the ovarium, I should certainly make it a rule to defer the operation of tapping as long as possible: first, for the rea-

son I mentioned before;—that it is a fact, (as is also a common opinion among the vulgar), that when you have once tapped a patient, she soon requires to be tapped again; and secondly, because, although in an early period of the disease there may be many cysts, yet in general they ultimately open into each other; so that you have only one great cavity. Hence, if you tap early, you most probably draw off only a portion of the fluid by the operation;—the cysts being distinct, and not freely in communication with each other.

In these cases the only remedies that (so far as I am aware) are of any use, are iodine, and sometimes mercury. Indeed, the best practice, in cases of encysted dropsy of the ovaria, is to support the patient's strength; to put off tapping as long as you can; and to give no medicine whatever, except it be iodine. It is in vain to attempt to excite absorption by diuretics; and by purging you will only nauseate the stomach, and take away the appetite. I have seen cases of encysted dropsy of other parts of the abdomen yield, apparently, to the free exhibition of iodine internally, and its application externally; and I have seen it succeed partially in dropsy of the ovarium. I have fancied that the power of this remedy has been increased, in a trifling degree, by combining it with mercury.

Very often, when an ovarium is enlarged, there is no fluctuation to be found for a length of time. The walls are solid;—solid substance is deposited; and it is not till the fluid has accumulated to a considerable extent, that you can discover fluctuation. Encysted tumors of the abdomen, especially in young women, are partly solid and partly fluid; and occasionally, if you squeeze the part, you find small moveable tumors, having portions of cartilage sometimes deposited in them. In some cases you find hydatids within. I had a case, in 1828, in which there was a tumor of this description; and which I concluded was a tumor of the ovarium. Fluctuation was not very apparent; but still there was fluctuation. I was giving this patient considerable doses of calomel,—on account of there being a large quantity of solid substance, apparently of very great hardness,—when she was seized with violent vomiting and purging, accompanied by intense pain. Whether the vomiting and purging arose from the calomel, I will not say; but she had been taking it for some little time; for I fancied there might be solid matter, as well as a collection of fluid. In the course of one night, the tumor entirely disappeared; after having resisted every other means for some months. It might be that the tumor, in this case, had burst into the peritoneum; and that the fluid had been quickly sucked up by the absorbents of the peritoneum, and as quickly secreted by the vessels of the kidney. Or it might be that violent purging being set up, a great discharge took place from the intestines; and the absorbents went to work, and reduced the tumor. However that may have been, the fluid re-accumulated; and the tumor became as large as ever;—and that after no very great lapse of time. One would hardly suppose that the absorbents within the tumor, were sufficient to produce such rapid absorption. It is more likely that the tumor

had burst at some part. It would appear (at least we are told) that occasionally the fluid has been discharged by the vagina;—that tumors of this kind have ruptured into the peritoneum;—that the fimbriated extremities of the fallopian tubes have set to work, and have poured the fluid into the uterus; and that thus it has been discharged through the vagina. There are several cases on record, of women falling down with ovarian dropsy; and beginning, very soon, to discharge a quantity of water from the vagina; which discharge has continued till the swelling has disappeared. It is sometimes difficult, in these cases, to know whether the water comes from the vagina or the urethra. If it come from the former, we must suppose that the tumor has ruptured, and that the fallopian tubes have pumped up the fluid; whereas, if it come from the latter, we must suppose that the vessels of the peritoneum have sucked it up, and that it has then been re-secreted by the kidneys.

DROPSY OF THE FALLOPIAN TUBES.

Occasionally you will have what perhaps may be, and sometimes is, called "encysted dropsy of the abdomen," arising from a fallopian tube being closed at each end, and a great quantity of fluid being amassed within.

TYMPANITES.

Occasionally air is collected in the peritoneum; and this is one of the diseases called *tympanites*. Sometimes the intestines are exceedingly distended with air; so that the person becomes very large, and the tumor gives rise to a sound like a drum; whence it is called tympanites (from τυμπανον, *a drum*). But, properly speaking, tympanites is a great collection of air in the peritoneum; and I believe this usually takes place from an aperture existing in the intestines, so that air escapes.

DISEASES OF THE PANCREAS.

Having said thus much on disease of the peritoneum, I shall speak of those of particular organs; and first of all of diseases of the pancreas.

The diseases of the pancreas with which we have to do, are all structural. We do not know whether there is any *functional* disease to which it is liable; unless it be the formation of stone. One does not know what office the pancreas performs, either when it is *out* of order, or when it is *in* order. We know nothing about it. No one would refer a symptom that he has, to mere functional disease of the pancreas. It is very seldom that it is the subject of *acute* inflammation. I never met with such a case. But now and then it is diseased in a *chronic* manner; especially when there is disease of a neighbouring organ.

The diagnosis of structural disease of the pancreas, must be exceedingly difficult. Dr. Pemberton, in his work on Diseases of the Abdominal Viscera,* says there is deep-seated pain in the epigastric

* "Practical Treatise on Various Diseases of the Abdominal Viscera. By C. Pemberton, M.D."

region; especially if one hand be placed at the back, and the other on the stomach. However, the pain may not be felt; or you may have pain there from an affection of the stomach;—so that very little, I conceive, is to be learned from that. He says there is more or less sickness, gastrodynia, and emaciation; but I should think that, in general, it must be a mere guess, even if the person is right, when he pronounces that the patient is labouring under disease of the pancreas. The most common affection of this organ, is either common induration, or that particular disease called "scirrhus." Dr. Baillie says that he once saw an abscess in it; and now and then common ulceration is seen. It is said to be sometimes ossified; and sometimes to have hydatids. Sometimes it is wasted, and sometimes it is very large; but, for the most part, this organ is not found diseased in dead bodies; and whenever it is, I believe the disease has evidently been of a chronic form.

PANCREATIC CALCULI.

Now and then a calculus exists in the pancreatic ducts. I opened a patient, not long ago; and was surprised to find calculi in the pancreatic duct. I forget what was the matter with him. The appearance was exactly the same as that given in one of Dr. Baillie's engravings. You know that the duct of the pancreas runs the whole length of the organ; that it is fine at one end, and large at the other; and that the ramifications of it, altogether, look like a feather. I believe these calculi are always homogeneous; and there must have been at least a hundred in the case that I opened. The duct represented in Dr. Baillie's engraving, has attained an enormous size. Pancreatic calculi were analyzed by Dr. Wollaston; and were found to consist of carbonate of lime in the human subject, and phosphate of lime in the ox. But these topics are more the subject of Morbid Anatomy, than of the Practice of Medicine.

DISEASES OF THE SPLEEN.

The next disease of which I will speak, is an affection of the spleen. We know nothing of disordered *function* of the spleen, any more than of disordered function of the *pancreas*; but structural diseases of the organ, and inflammation of it, are sometimes exceedingly evident. Like the pancreas, it is very rarely affected with *acute* inflammation, or with suppuration. Now and then, in peritonitis, that portion of the membrane covering the spleen is inflamed; but, to speak more particularly of the substance of the spleen itself, inflammation and suppuration are exceedingly rare. When it is the subject of *chronic* inflammation, there is pain in the region of the spleen;—pain far back on the left side, higher than the kidney; but there are no symptoms of chronic inflammation of the kidney;—such as a retraction of the testicle, pain down the thigh, pain in the testicle, and an unnatural desire to make water. There is an absence of the symptoms of inflammation of the kidney.

It is not uncommon to see the spleen enlarged after ague. You

will recollect my stating, that this disease is called "ague-cake" by the common people; but technically it is termed "hypertrophy of the spleen." When it is in this state it is generally harder than natural. The size that the spleen will attain, is very considerable. I have seen it reaching the pelvis; and extending from the navel towards the other side. You will easily distinguish between an enlargement of this organ, and an enlargement of the liver, by this circumstance;—that, on applying the fingers, you find the edge is vertical; whereas, in enlargement of the liver, you find that the edge of the tumor is horizontal. The hypertrophied spleen has sometimes weighed twelve pounds. Hoffman mentions finding one that weighed fifteen pounds; and Morgagni, on second-hand information, mentions a case where the tumor weighed thirty-five pounds.

This disease will occur in children, and I have frequently seen it in infants. It generally arises after ague, or after the patient has been exposed to malaria. I met with a singular instance of this enlargement, about a year ago. A woman had two children; and she herself had had ague, but they never had. I rather think she had lived in an aguish part of the country, before the children were born. One of them had enlargement and induration of the spleen, and died. After a time, the same disease began in another child; and I believe it is going on now. I have no doubt but that it will kill it. On opening the body of the first, we found the spleen enlarged, and very hard; but, in other respects, the structure appeared healthy. There was no unnatural appearance in it.

Patients, in this disease, are generally very pale. The blood is not proper in *quality*, if it be in *quantity*;—it is deficient in fibrin, and likewise in red particles. The wasting of the body is not in proportion to the paleness. The patient's bulk remains pretty good, for a long time; although he will become blanched,—in a state of anæmia. Now and then there is a little ascites. The peritoneum covering the spleen becomes affected, like the rest of the membrane; and produces a larger secretion than before. The diagnosis is very easy, long before the spleen has attained to a large size.

With regard to the *treatment*, it would be merely that for any chronic inflammation, or induration. I believe that, if the tumor attains any very great size, nothing can be done; but I have diminished it by the administration of iodine, externally and internally. I have successfully treated many cases in this way; but I have seen others in which treatment of this description failed. If there be pain on pressure, local bleeding, mercury, and the common remedies for inflammation, will be proper. Where the disease has arisen from malaria, it would certainly be well to give the sulphate of quinine; for I have seen improvement take place where the constitution has suffered from malaria; and I have also seen enlargement of the liver much diminished, and give way, with very little other trouble. If, therefore, there had been any exposure to malaria, I should give the remedies for ague; but iodine has frequently, I know, a considerable effect in diminishing diseases of this description. Some-

times there is no pain whatever; and there, of course, you would not think of applying leeches, or bleeding the patient. But if there be pain on pressure, local bleeding ought to be resorted to, in proportion to the general affection.

MISCELLANEOUS DISEASES OF THE SPLEEN.

Sometimes, without any enlargement, you will find the spleen exceedingly *hard*,—cutting exactly like liver; and sometimes, on the other hand, it will become exceedingly *soft*. Very often where, during life, you could discover no particular ailment referrible to the abdomen, you find the spleen soft. If it be not preternaturally hardened, you may, by working it up in your hand, bring it to the consistence of currant-jam; but in various diseases you find that the spleen, on cutting into it, is soft.

The spleen suffers a great accumulation of blood, when there is any obstruction in the organs of respiration. It is supposed by some, that the size of the spleen may depend very much upon the mode in which patients die. If they die after long-continued dyspnœa, you may find the spleen large; although, during life, it was not so enlarged.

Tubercles, of various kinds, are found in the spleen; and I met with a singular instance the other day, of a large number of vessels in the spleen in a state of ossification. Calculi have been found in the spleen; but diseases of this organ are not very apparent, unless the organ itself becomes enlarged. You know it is said that people can do as well *without* this organ, as *with* it; and since the time of Galen, persons have amused themselves with cutting out the spleens of animals; and have said that they perceived no difference afterwards. It is said that the spleen, as well as the pancreas, has been absent congenitally; but such things must be exceedingly rare.

HEPATITIS.

We will now proceed to consider the diseases of an organ far more important than the pancreas or spleen;—namely the liver. It is very subject both to acute and to chronic inflammation. When the liver labours under *acute* inflammation to any considerable amount, the symptoms are pyrexia and constant pain, chiefly in the right hypochondrium. The greater part of the liver is on the right side; and therefore you have the pain chiefly there. There is likewise a sense of tension, or weight. It is said, that if the *surface* of the liver suffer, you have mere tension; whereas, if the *substance* be affected, then a weight is experienced; or if it be the peritoneal coat which is inflamed, then you have a greater degree of pain on pressure, and pain of a sharp character. The pulse is said to vary accordingly as you have inflammation of the peritoneal coat, or inflammation of the substance; but you cannot depend much upon that. You have different kinds of pulses, in various circumstances. The pain extends up to the scapula, goes through to the back, and very frequently to the right shoulder. The patient lies best on the

right side, and for this reason;—if he lie on the *left*, the whole mass of the liver (situated as it is chiefly on the *right* side) drags towards the *left*, and all the parts are put on the stretch. You find, in disease of the *heart*, that he lies best on the right side; and this is also the case in disease of the *liver*; but the situation of the uneasiness makes the difference between the two diseases very remarkable. There is difficulty of breathing, and an affection of the chest, in disease of the liver; but not so great as in disease of the *heart*. The difficulty of breathing arises from the motion of the liver, in respiration, in accordance with the ascent and descent of the diaphragm. There is likewise, from the proximity of the liver to the diaphragm, a dry cough; and if you have any doubt about the situation of the pain,—whether it is just on one side the diaphragm, or on the other,—you have only to apply the stethoscope. If it be disease of the *liver*, you find no alteration of the sounds; whereas, in an affection of the *chest*, you will find the various signs which I mentioned before. From the proximity of the liver to the stomach, there is very frequently nausea and vomiting. Very often there is a little jaundice; and sometimes *complete* jaundice.

This acute inflammation frequently terminates in resolution; and sometimes in suppuration. The latter circumstance is rare in this country; but in hot climates it is very common. Occasionally,—as you will recollect I mentioned when speaking of suppuration of the brain,—the pus is secreted in small drops throughout the organ; but in other cases it forms one immense abscess; and sometimes both circumstances occur. The quantity of matter which will be collected in this way, is sometimes enormous. There are various ways by which nature gets rid of this pus. Occasionally an adhesion forms between the two parts of the peritoneum,—the loose and the visceral; and the matter points externally. Sometimes an adhesion takes place to the stomach, sometimes to the intestines; and I think the matter more frequently finds an outlet in that way, than in any other. Sometimes nature does not succeed in forming adhesions; and then the matter is poured into the peritoneum. Now and then an occurrence takes place less favourable than the discharge of the pus, into the stomach and intestines;—adhesions take place to the diaphragm; and the matter is discharged through the air-passages. We have cases on record, in which the pus has discharged itself into the gall-bladder; and cases still more rare, in which it has presented itself at the back; nor at the *front*, or at the *side*; but at the *back*. Cases of this description have been mistaken for lumbar abscess. Occasionally the matter has been discharged with the urine; and there is one case upon record, in which an abscess emptied itself into the vena cava; and death was the consequence. Sometimes the abscess does not discharge itself at all, but there it remains; and patients have died with a large abscess in the liver;—the existence of which was not known before. If the matter be disposed to discharge itself externally, it is evident enough; if it discharge itself into the stomach, you have vomiting of matter; if into the intestines,

you have a quantity of matter in the stools ; and if it discharge itself by the air-passages, you have cough, and many of the other signs of phthisis.

But more frequently than not, perhaps, the *acute* disease subsides into the *chronic* form. If the inflammation be situated on the surface, you will have great chronic inflammation ;—you will have great pain there, especially on pressure ; and (in all probability) ascites,—from the peritoneum being affected. If the substance only is diseased and the peritoneum escapes, you have merely a dull heavy pain there ; and very frequently no ascites at all. Of course you may have chronic inflammation of the *substance*, and of the *surface* of the liver conjoined ;—the same as in the acute form ; and the former, as well as the latter, will produce an abscess, and be followed by all the structural diseases to which the part is subject. The *acute* form of the disease is very common in all the fevers of hot climates ; and hepatities is continually united with all other inflammations of the abdomen ;—with enteritis, peritonitis, gastritis, and all the other inflammations of that region. The *chronic* form is very often united with dysentery. It is very common for a person to have chronic *dysentery*, and chronic *hepatitis* at the same time.

The *causes* of hepatitis, whether acute or chronic, are the common causes of inflammation ; getting wet, exposure to cold, and other similar occurrences. It appears to be much predisposed to by continued heat ; the disease, at least, is very common in hot climates. It is said that long-continued heat alone induces pure hepatitis ; whereas, if the long-continued heat be united with the cause of fever,—such as malaria and other things,—then you have a combination of hepatitis with various fevers. As to the *diagnosis*, the disease is easily distinguished from inflammation of the chest, in the way I have mentioned ;—by the absence of all auscultatory signs ; by the situation of the pain ; and by there being nausea and vomiting. It is distinguished from gastritis by the situation of the pain, which is much to the right side ; while, in gastritis, it is in the epigastrium, and more to the *left* side,—from the stomach being to the left of the epigastrium. You may have symptoms at the epigastrium in hepatitis ; but you have also considerable pain on the right side. It is distinguished from peritonitis by the local nature of the pain ; for, in peritonitis, there is inflammation at other parts of the abdomen.

We have now to consider the *treatment* of acute and chronic hepatitis ; and this may be dismissed in a very few words. It is the simple common treatment of inflammation ; and, for the most part, it is very successful. You have only to make your diagnosis ;—to ascertain that it is disease of the liver, acute or chronic ; and to treat it accordingly. I may mention, however, that it was once supposed (as you will find mentioned in works published twenty or thirty years ago) that mercury ought not to be given in *acute* inflamma-

tion of the liver, because it stimulated the organ; but that it was proper in the *chronic* form. The truth is, however, that both forms require the same treatment. The terms "*acute*" and "*chronic*" refer merely to the *duration* of the disease; and there is no difference between them, except that the symptoms are less urgent at one time than at the other; and whatever is good in the one, is beneficial in the other in a less degree. But independently of that consideration, I do not know that mercury has any extraordinary power in stimulating the liver, in the way that has been supposed. It was thought it would give a bilious tendency, when there was not one; and it is possible that mercury may produce bilious evacuations, when it is long continued; but I am sure that mercury, pushed on to ptyalism, is just as useful in active hepatitis, as in any other acute inflammation. I do not know that it will do any good by its specific action on the liver; but it will by its general tendency to subdue active inflammation. Purgatives are particularly useful in inflammation of the liver;—much more so than in inflammation of the chest; because they act as local means, and prevent a great quantity of blood from going into the vena portæ; and therefore less gets into the liver.

The *chronic* inflammation requires the same treatment as the *acute*, only carried on less violently,—carried on chronically;—not doing all you have to do in a day or two; but carrying on your measures for some weeks, or even months. The moderate exhibition of mercury,—not to produce a rapid ptyalism, but so as to keep up a gentle affection of the mouth,—is useful. Long continued purging is very beneficial in chronic disease of the liver; and hence the Cheltenham waters do great good in this affection, by draining the abdomen generally. Some have conceived that acids are useful as tonics; and the nitric and muriatic acids were very famous some time ago; but I do not know that there is any particular use in them. I have always succeeded in treating chronic inflammation of the liver, by the same means that I employ in any other inflammation;—more or less loss of blood, general or local, and the moderate exhibition of mercury. I have never found it necessary to make any difference between treating inflammation of the liver, and inflammation in any other part. Some have thought that dandelion does good; but I have never seen its virtues in affections of this kind.

As to the suppuration which sometimes occurs, that requires to be treated on common principles. If the abscess point to the skin, of course a knife may be applied, and the matter let out;—just as in any other abscess; only that it might be dangerous to let out a great quantity at once. It should be done gradually, in order that the part may slowly contract. If the discharge take place inwardly through the lungs, or the intestines, you have only to lessen the irritation by narcotics,—as in other cases; and this will also be required if you open the abscess.

STRUCTURAL DISEASES OF THE LIVER.

Many diseases of the liver are called "chronic hepatitis." The liver is subject to a vast number of structural diseases; and these pass as chronic hepatitis. Indeed, it is very often impossible to make the distinction. You will find, at the outset, pain on the right side, pain at the shoulder, perhaps a little jaundice, tenderness in the region of the liver, feverishness, and wasting; and you may say that the patient is labouring under chronic hepatitis. You treat him accordingly; but find that you do not succeed. On the contrary, the disease obstinately remains; and at last, perhaps the liver becomes thickened much, and very much enlarged. Sometimes it is enlarged and hardened, from the very first;—simply as the result of inflammation; and sometimes it may be subdued by the common remedies of inflammation. I am quite sure that the liver will inflame from mere turgescence of blood; and perhaps without inflammation,—from mere congestion,—it will become very large. I am sure that the bulk of the organ will alter, according to the quantity of blood in it; for I have seen it large, and very soon (in a week or two) it has been small again. I have no doubt that internal organs will vary very much. They will suffer (if I may so speak) a sort of *erection*, from the congestion of blood. Certain it is, that the liver will sometimes be large from blood; and by active measures will be brought down, in a very short space of time, to the natural state.

But supposing you have used the remedies for inflammation, and that the disease does not cease, and that the size of the liver does not diminish, then you have reason to suppose that there is something more than chronic inflammation;—that there is a change of structure; and it is of no use to push on, with activity, the means for remedying inflammation. Indeed, you would only break up the constitution by them. It may be necessary, if there be pain and tenderness, to bleed occasionally, (either by cupping or leeches), to exhibit mercury, and to order low living; but if you push these things far, you frequently break up the patient's constitution, without affording him any relief. It is often necessary to support the strength well, and even to give the patient stimuli, in order to enable him to bear up against this organic disease.

With regard to the *signs* of organic disease of the liver, you may sometimes make it out very well, by the edge of the liver being well defined;—running across, and being hard, and even sharp. You will sometimes find that the most easy way of discovering an indurated liver, is not by pressing hard down around the region of the organ; but by putting your hand over it, and suddenly bringing down the fingers. Frequently the liver is an inch or two from the surface; and if you press it regularly, you may not feel it; but if you press the integuments down upon it, you feel it in a moment. Occasionally you may discover *tubercles* in the liver.

In all these cases, it would be quite fair to have recourse to iodine, in the form of hydriodate of potassa,—both internally, and rubbed

over the indurated part. I have seen large livers reduced by this means. I have seen livers reaching to the umbilicus, and below it, reduced by the steady use of iodine, and sometimes iodine combined with mercury. But it is frequently necessary, while you are doing this, to support the patient well;—especially if you exhibit mercury. Not only should mercury be given with caution, but you should support the patient well; because the dose that is necessary to do good, tends to impair the constitution. Iodine, however, may be made to do good without injuring the patient. Setons may, perhaps, be serviceable. This is the general treatment of diseases of the liver; and we will now speak of the post-mortem appearances.

On examining the liver after it has been in a state of common inflammation, you will find that it is the convex portion of the liver that is generally inflamed. There may be red points, lymph, and turbid serum upon it; and the peritoneum may perhaps be thicker than it should be. In chronic inflammation you will find adhesions; and the bands are very strong. Sometimes you will see white patches on the surface of the liver; and the peritoneum will become white, opaque, and soft. If the substance have been inflamed, there is usually a general redness; and the size of the liver is increased,—from the quantity of blood it contains. Sometimes the redness is only partial; and then the liver looks almost mottled. When the redness is only partial, then the red plates, mingled with the parts naturally pale, give it a mottled appearance. In cutting the liver, generally a large quantity of blood flows out; and you must remember that, without inflammation, the liver frequently suffers a great congestion of blood. In the disease called "purpura," there is great congestion of blood in the liver. After asphyxia, chronic bronchitis, all diseases of the heart, and all obstructions to the course of the blood through the heart or lungs, you will find the liver in a great state of turgescence; so that when you cut it, the blood pours forth, and the vessels look like sinuses. In infants who have been asphyxiated at birth, the congestion of blood in the liver is occasionally so great at the part under the peritoneal coat, that sometimes it will burst through it into the abdomen. Sometimes, in inflammation of the liver, there is hæmorrhage into the substance of the organ; and sometimes the blood will *rupture* the substance of the organ. I presume there must have been some degree of softness of it previously. You may find a great mass of blood, or several little collections of it; sometimes it is coagulated, and sometimes not; occasionally you may find it in the vessels, and sometimes not;—accordingly as it has oozed from one, or from several.

CHRONIC DISEASES OF THE LIVER.

With regard to chronic disease of the liver, you recollect that the liver, like the kidney, consists of two parts; the one sanguineous and red; and the other white or yellow,—containing bile. They are not divided; but throughout the liver there are two constituent parts, lying in juxta-position. Now sometimes it is only the *red* portion of

the liver that is hypertrophied; so that the organ is enlarged and red. Sometimes it is the *biliary* portion;—the bile-tubes are all in a state of hypertrophy; and then you have a *pale* liver,—a liver enlarged and pale. Sometimes, without being enlarged at all, it will be pale. The *red* part is *atrophied*,—the vessels shrink; and the *biliary* part is *hypertrophied*; or if not hypertrophied, it is *indurated*; or if not indurated, it remains as it was; but as it has a preponderance over the *red* portion, the liver looks *pale*. These changes sometimes occur throughout the liver, and sometimes only in spots;—so that here and there you have one portion of the liver firmer and redder than it should be; while, perhaps, in other instances you have the *biliary* portion hypertrophied here and there,—giving it a mottled appearance.

GIN-LIVER.

Sometimes the hypertrophied portion of the liver gives you the appearance of white lines running along it; and sometimes of granules,—varying in size from that of pins' heads, to that of hazel-nuts. There is a difference of opinion, among morbid anatomists, with regard to this affection; which was called "gin-liver," and which is the most common of all organic diseases of the liver. Dr. Baillie and others suppose that it was caused by minute yellow tubercles throughout the liver; and Andral imagines that it is a mere hypertrophy of the biliary portion. Cruveilhier has given a good delineation of this disease; and has called it "small brown tubercle." I suppose, as it is a "*gin*-liver" in this country, it is a "*brandy*-liver" in others. Perhaps "*alcohol*-liver" would be the best name. It occurs in spirit-drinkers in *one* country, just the same as in *another*. There is the same punishment for them all. I presume that the constant use of alcohol, induces a chronic change of the biliary portion of the liver;—causes it to become hypertrophied, and indurated;—just as any serous membrane will become (from other circumstances) indurated, opaque, and hard. This is the history of this particular matter.

You sometimes see this morbid change more in one lobe than in another. Sometimes the liver is increased altogether; and sometimes, instead of being *increased*, it is *shrunk*. The liver generally feels very hard on the external surface. Frequently it is indurated in particular portions; but wasted on the whole. I think you find that, in by far the greater number of cases, a "gin-liver" is of a bright yellow colour; and generally there is more or less ascites. The peritoneum over the liver is generally more or less diseased. It is particularly opaque and hard.

FATTY DEGENERATION OF THE LIVER.

Perhaps the disease to which the liver is most liable, is that of becoming fatty. The liver is sometimes exceedingly fat. You know that the liver naturally contains fat and cholesterine; and these matters will sometimes exist in a great degree. When the liver has

degenerated into this fatty state, instead of being indurated, it is usually soft and flabby. Sometimes it is greyish or whitish; and such is the quantity of fat deposited, that it greases your fingers. When you cut such a liver, or handle it, your fingers become greasy; and in those parts which are the most fatty, it appears as if there were no blood there at all. This disease, like every other, will affect either the whole liver, or only portions of it. This state is frequently united with phthisis. It is a disease seen continually;—without the person having been addicted to drinking, or having imbibed any bad habits. It frequently occurs in young persons.

ENCEPHALOID DISEASE OF THE LIVER.

The liver is also subject to encephaloid disease;—to what is called "fungus hæmatodes." This is much more rare than either of the other forms of disease to which I have adverted; but when fungus hæmatodes has existed in the extremities, then it is very common for a collection of this nature to take place in the liver. Occasionally, I believe, encephaloid tumors are said to be found in the liver, without the disease occurring in other parts; but more frequently they are found in combination with disease of the extremities. These tumors are, of course, white; and sometimes there are tuberæ, producing an elevation on the external surface;—bumps. They are of various sizes;—some existing near to the surface, and some towards the centre of the organ; and when you cut them, you find they contain a brain-like substance.

SCROFULA, SCIRRHUS, AND MELANOSIS OF THE LIVER.

The liver is also subject to another disease,—to a new formation; namely, *scrofula*. Scrofulous tumors take place, from time to time, in the liver; and they are, of course, white. The encephaloid tumors look exactly like them. Cruveilhier has given some good representations of them. The scrofulous disease is sometimes mixed with *encephaloid* matter,—with "brain-like" substance; and sometimes there will be a mixture of *scirrhus* with it. I have frequently seen scirrhus in other parts, with scrofula deposited in its neighbourhood; and so it is in the liver. Occasionally *melanosis* exists in the liver;—the black deposit of which I formerly spoke.

The foregoing are the chief organic diseases of the liver. Besides inflammation, you may have enlargement from congestion of blood, or from abscess;—you may have the red part hypertrophied here and there,—so as to give the organ a mottled appearance; and indurated at the same time,—so as to give you red tuberæ;—"tubercles," as they have been called in this country; but I would rather say "tuberæ." Then you may have the *biliary* portion hypertrophied; and that is called "gin liver." In addition to that you may have encephaloid tumors, resembling the brain in structure, consistence, and colour; and perhaps with blood effused in them here and there. Lastly, you may have scrofulous and scirrhous tumors, and melanoid deposit.

As to the size which the liver may attain, Mr. Gooch, a surgeon, mentions that he saw one which weighed twenty-eight pounds. I have frequently seen it reaching into the pelvis. It is a curious circumstance, but you will sometimes meet with a liver thus enlarged, which has caused no suffering at all. The patient has never complained of pain; but has felt weak, and has wasted a great deal. This is particularly the case in women. I have frequently examined women in this state; though, during life, they were not known to have disease of the liver. They never drew attention to the abdomen; but merely said they were weak. It shews the necessity, when you cannot understand patients, of having them placed in bed; and of examining them from the throat downwards,—over the heart, lungs, and abdomen. In that way you will continually meet with something, which was not in the least apprehended.

HYDATIDS OF THE LIVER.

The liver is very subject to the formation of hydatids. The kidneys and the liver are the two organs of the body, which are most subject to the formation of hydatids. The true animal nature of these hydatids, has not, I believe, been pointed out in the human subject; though it has in sheep. In sheep they have been observed to have a contractile power; but this has not been noticed in human beings. The appearance, however, is so much the same, that one must suppose them to be real hydatids. They are sometimes inclosed within others;—like pill-boxes. Sometimes they are attached by peduncles, hanging one within the other; and sometimes they grow to the outside of each other. You will see a representation of them in Dr. Baillie's work. Sometimes they are attached to the liver externally;—they hang to it; but, generally speaking, they are enclosed in a cyst. Sometimes they are found in the middle of the substance of the liver. The cyst which contains them is usually hard,—even cartilaginous. I believe they have two coats; and when dead, they have no longer a globular appearance; but are like so many skins, or so much half-dried mucus. In sheep, I believe, they are seen to have a neck and a mouth.

I had a very remarkable instance of this description, in a lady who had laboured under chronic hepatitis for fifteen years. At last she began to cough, and to spit hydatids; and died. On opening her, I found a large cyst of these hydatids, attached to the concave portion of the liver, on the right side. In the middle of the liver, there was another sac filled with them. Ulceration took place, and they made their way through the diaphragm;—the cyst emptying itself partly into the air passages. Under all this the irritation was so great, that she died.

WORMS IN THE LIVER.

Worms have sometimes been found in the human liver; and a lumbricus has been found in the ducts; but I should rather think it

was a wanderer,—that it was not a native; but that being on its travels from the intestines, it lost its way.

In the diseases of the liver which we have now described, you can do nothing more than treat the patient upon the common principles of inflammation, endeavour to excite absorption by means of iodine and mercury, and support the patient's strength. As to the greater number of them, you cannot distinguish them during life. You can tell that there is organic disease, by feeling that the liver is very large and very hard, by the patient wasting away, and becoming sallow and jaundiced; and sometimes you find there are tuberæ (bumps) in the region of the liver; but very often it is impossible to say what exact structural disease there is. If you have seen fungus hæmatodes, or scirrhus, in other parts of the body, you may suppose the disease in the liver to be of that nature.

JAUNDICE.

The next disease of the liver of which I will speak, is one in which the secretion (instead of passing out properly into the intestines) is absorbed, enters into the blood, and tinges the skin and the urine yellow. I need not tell you that this disease, in common language, is called *jaundice*;—a term which is derived from the French word "*jaune*" (yellow).

In brutes it is called "the *yellows*." In medical language it is called *icterus*;—from its likeness to the plumage of the golden thrush. The word "*icterus*" is said to be the name of the golden thrush; by looking at which, like the Israelites looking to the brazen serpent in the wilderness, it was thought that those that had the disease would be cured.* You know that it was common, in ancient nations, for the cure of disease to be attempted by looking on certain things; and I suppose it had its origin from what occurred to the Israelites. The heathens fancied, when labouring under this disease, that if they looked upon the golden thrush, the bird would die and they would be cured. You will find that, in Latin, jaundice is termed *morbus regius*,—"the royal disease;" and the reason given by several writers is, that in this affection persons require all sorts of amusements, that none but kings or royal persons can command. It is also called, in Latin authors, *morbus arquatus*;—from the patient having the various hues of the rainbow (arcus). You will find it mentioned under another name,—*aurigo*. I presume this has its origin from *aurum*,—"gold." The word "*jaundice*" is simple, and a very fine name for "yellow." In the case of poor people it is called, in plain terms, *the yellows*; but if a lady have the disease, it is termed *jaundice*.

This disease is marked by yellowness of the skin, yellowness of the eyes (the conjunctivæ), yellowness of the roots of the nails, yellowness of the urine, and paleness of the fæces. You may have this

* "Moses made a serpent of brass, and set it upon a pole; and it came to pass that, if a serpent had bitten any man, when he beheld the serpent of brass, he lived."—Numbers XXI. 9.

disease without the fæces being pale; but speaking of the symptoms generally, the fæces are pale. The parts which are first seen to be yellow, are the nails and eyes; and they are the parts that remain yellow longest. It is simply for this reason;—the half-moon of the nails (as it is called), and the conjunctivæ of the eyes being naturally so very white, you discover in them the slightest tinge of yellow. The yellow is not always of the same cast. You know that there is a *bright*, a *dark*, and a *green* yellow; and some persons labouring under jaundice, are of a dark olive-colour, so that it borders upon green; and therefore you sometimes hear of "*green* jaundice." If a person be naturally swarthy, when labouring under green jaundice he looks very dark; and then he is said to have "the *black* jaundice;"—so that you have a *green*-yellow and a *black*-yellow. It is a contradiction of terms; but it shews the variety of hues under which the disease appears.

Occasionally it has happened that patients have "seen yellow." It was maintained, by some, that that was *always* the case. Dr. Pemberton says he saw this occurrence twice; and that, in both cases, the jaundice was not very intense. On the other hand, you will every day see cases of intense jaundice, without any yellowness whatever of the vision. Hoffman says also, that twice he saw patients, who declared that every thing appeared yellow. It has happened to me to have two patients labouring under jaundice, who made the same statement. In July, 1826, I had, in St. Thomas's Hospital, a case of icterus, where there was albugo of each eye,—particularly of the left. Into this eye ran two large red vessels, and with it the patient "saw yellow;" but the right eye, which had no inflammation before the cornea,—into which no large vessels were running, saw things in their natural colour. In 1827, I had another hospital-patient, who "saw yellow" with both eyes; and in him the conjunctiva immediately around the cornea,—quite at the edge of the orbit, was greatly inflamed. This morning I saw a patient labouring under jaundice, who says that, at the beginning of the disease, he "saw yellow." He does not know whether his eyes have been inflamed; but it is a fact that there are several pretty large vessels running, not quite to the cornea, but pretty close to it. When patients "see yellow," it is from the serum of the blood being conveyed before the pupil, through the cornea. It must be accounted for in that way. In the second case of this occurrence which I met with, I was prepared for inflammation of the eye, by having noticed what I did in the first case. I looked carefully at the man's eye, the instant he told me that he "saw yellow;" and I found, as I expected, that it was in a state of inflammation. Whether this will always be observed when patients "see yellow," I do not know; but it affords an explanation of the circumstance, and is worth investigating. If a person labouring under jaundice be blistered, the fluid from the blister is yellow; and the serous fluids within the body, are found to be of the same colour. It is worthy of remark, that the blood of jaundiced patients is loaded

with bile. Hunter thinks that the artificial mixture of bile with the blood, produces coagulation; but I think that a quantity of bile infinitely too little to affect coagulation of the fluid, may nevertheless be sufficient to give a tinge to the serum.

Besides these visible symptoms in jaundice, there are several others. You generally find patients complain of languor, and very frequently of drowsiness; but still more frequently they complain of a dead weight,—a load at the epigastrium, and of tenderness, and sometimes actual pain at the hypochondrium. In fact, this is a disease which every day occurs in conjunction with hepatitis; and is, in many cases, merely a symptom of it. There is frequently loss of appetite, nausea, and vomiting; and there is one curious symptom in the disease, which is very common indeed; and that is an itching of the whole surface. People say they "could tear themselves to pieces."

Jaundice, like so many other diseases, occurs both in young and old persons. Infants often have it a few days after birth, and some perhaps at birth; and the oldest persons are liable to it. In infants, it appears to be produced from the very slightest causes; and it is cured with the utmost ease. In general, it is a slight disease, arising from slight causes; and may be cured by slight remedies.

You will sometimes see yellowness of the skin, not as the result of jaundice, but in fever; namely, that which is called "*yellow* fever." The yellowness is not universal in this case. It occurs particularly about the neck; and it appears rather to arise from a disordered state of the blood, or an altered condition of the blood as to some of its constituents;—exactly as we see it in bruises. You may have a person yellow from bruises. After a certain portion of blood has been absorbed from an ecchymosis, a degree of yellowness remains; but that is not jaundice. It appears to be produced from some portion of the blood being absorbed, and other portions left. Occasionally, after the bites of certain serpents, and the infliction of wounds by the bite of certain animals, the skin will become yellow; but this does not appear to be jaundice.

Some people would appear to have a constant predisposition to this disease; and it may be hereditary. Persons who have been in warm climates, are much more predisposed to the disease than others. The *exciting* causes of it, are any circumstances that will produce inflammation and congestion of the liver. Whatever will produce hepatitis, or cause great congestion of the liver, will produce jaundice. It may arise, not only from cold and wet, and from long-continued heat, but also from the suppression of a discharge; by which a congestion of the liver will be produced. It will arise from any thing that will cause even a mere excess of bile; for occasionally the fæces, in this disease, are not white. Bile passes into the intestines; but so much is secreted, that all does not escape; and a portion goes into the blood. Malaria seems to have a tendency to produce it in hot climates, and in the hot seasons of other

climates. Persons exposed to the influence of malaria, are very subject to have more or less jaundice among them, as well as other hepatic affections.

It may be produced by a variety of *local* causes;—any thing which will cause pressure upon the parts through which the bile is conveyed. Mere costiveness has been known to give rise to it. Tumors occasioned by an enlarged pylorus, or by an enlarged head of the pancreas,—tumors of the omentum,—diseases of the liver,—the lodgment of a calculus in the ducts, are also common causes of this disease. If a portion of liver becomes harder than it should be, and perhaps rather enlarged, the bile may be obstructed in the liver itself. Sometimes pregnancy causes it. I have frequently seen jaundice in pregnancy;—not, however, as the result of pregnancy; but as the result of inflammation of the liver; and which went away under the treatment for common inflammation, while the pregnancy went on. It is supposed that it may be occasionally produced by thick bile; but if you do find the bile inspissated, there is no proof that it is the cause of the jaundice; for if there be any obstruction to the bile, the latter, by its continuance, will become thicker than it should. Where the fluid parts are absorbed, the bile may be inspissated; but there is no proof that this is the *cause* rather than the *effect* of the jaundice. It has been known to be caused by a lumbricus sticking in a duct of the liver. I mentioned, when speaking of worms in the liver, that a lumbricus has occasionally been seen, which had lost its way, and wandered into the liver; and if it stick there, it may cause jaundice. If the ducts themselves become thickened by chronic inflammation,—if they become hypertrophied, their canal may be so much diminished, that the bile cannot easily pass; and consequently you have jaundice. I have seen jaundice from a great many of these causes; and, in 1829, I met with a case, in which it was occasioned by a great number of fatty deposits, all round the ducts. Sometimes the ducts are impervious from original malformation. There are a few instances of this upon record. It would appear sometimes to be produced by spasm. I have known some persons, on eating certain articles, to be seized with violent pain at the pit of the stomach; and the next day an attack of jaundice has appeared. It has been produced by mental causes. Many persons have become yellow from fright. I believe that, in general, people from fright look *blue*; but sometimes, from being exceedingly frightened, persons will have a fit of jaundice. Occasionally the disease has arisen, not from terror, but from long-continued grief and anxiety of mind.

When the ducts have been obstructed, they are generally larger than they should be; and Dr. Heberden is said to have seen them dilated to an inch in diameter. Sometimes, however, no obstruction is found. I have opened several persons who have died, not *from* jaundice, but *with* it, in whom I could see no obstruction whatever; and Sir John Pringle mentions, in his work on Diseases of the Army, that one of the army-surgeons told him of a case of jaundice,

in which there was no obstruction; but in which the slightest compression caused the bile to flow.* Andral, I find, says that he has seen the same occurrence.

You may produce this disease artificially, by opening the abdomen, and passing a ligature round the intestines, a little below the ductus communis choledochus. Portal has done this (he says) in six dogs; and they all became jaundiced. If you tie the lymphatic duct, the same circumstance will occur; and the absorbents of the liver have been seen, after such an experiment, to become loaded with bile. It has been said, however, that the blood from the lymphatic veins was found, in such an experiment, to stain paper yellow;—much more so than the blood from the choledochus. There was a doubt at one time whether, in jaundice, the bile found its way to the blood by means of the absorbents, or by regurgitation to the veins. A short time ago, it was not supposed that the veins would absorb. Before the absorbents were discovered, it was supposed that the veins performed that office; but afterwards, no one allowed that they would absorb at all; and now again it is said that they *do* absorb.† While it was believed that the veins did *not* absorb, some contended that, in jaundice, the absorbents took up the bile; and others contended that it worked its way into the veins. Experiments were then made; and it was observed that the absorbents of the liver were loaded with bile; and that the *lymphatic* veins were more tinged with it, than the *jugulars*. If the veins absorb as well as the absorbents (properly so called), we may suppose that, as the greater portion of bile which found its way into the whole system of blood, passed through the lymphatic veins, those veins would contain a greater portion of bile than any others.

With regard to the *prognosis* of this disease, it must depend entirely on the cause. Jaundice is nothing more, in most cases, than a symptom of some disease; and according to the nature of that disease, must be the prognosis. Some are very ill in jaundice, and die *with* it; and others labouring under it go about with little indisposition;—they scarcely know that they are ill; they only look very yellow. In that form of jaundice in which the yellow verges to green, and which has been called "*green* jaundice," recovery is very rare. When you see an individual labouring under jaundice, with his eyes yellow enough, but with a skin of an olive-hue, you may (without asking a question) fear that the individual has a disease, from which he will not recover. Dr. Baillie says that, in the whole of his practice, he never saw more than two persons recover from green jaundice. Generally, where the jaundice is of this green hue, there is some organic disease of the liver;—either of the whole or of a portion of it.

The disease sometimes lasts a very long time. The fæces are in general white; but very often they are bilious. Dr. Baillie says

* "Observations on Diseases of the Army. By Sir John Pringle."

† Consult, on this subject, Dr. Graves's Lecture on the Absorbents; of which a new edition has been published.

that, in green jaundice, the fæces are usually white,—as in other kinds of the complaint; but he has often seen them very pitchy. He says that there is but little pain felt; that there is seldom any ascites; and that he seldom knew it arise from intemperance. The reason that he assigns for the latter circumstance is, that it so frequently occurs in women. Some women, however, are intemperate enough. He considers it as a symptom of something which is fatal. Dr. Cheyne mentions that the jaundice of children is dangerous, if it be of a saffron-hue. In children the complaint is generally trifling; but sometimes it is not. Mr. J. Pearson (a surgeon of great practice in London, a few years ago) says that he knew a family where there had been eleven children, ten of whom died of jaundice within the month;—the disease having begun a few days after birth; and that the eleventh died of the same disease at six years of age;—evidently shewing the hereditary nature of the disease. What was the cause of it in this family, I do not know.

In the *treatment* of jaundice, you have first to consider whether any inflammation exists;—whether it is a case of hepatitis; and if it be, you must treat it on the common principles of inflammation of the liver,—in proportion to the weakness on the one hand, or the strength on the other. You will find that, in cases of jaundice, mercury answers better than any other purgative. I have frequently made experiments, and have exhibited common purgatives in some cases, and mercury, so as to affect the mouth, in others; and I am sure that patients have recovered more quickly by the latter mode, than by the former. In mild cases, however,—where there is only congestion of the liver,—the disease will yield to common remedies; and many cases will get well of themselves. But if the disease be more severe, it would be right to employ mercury, and perhaps to bleed in the arm. The disease may be characterized more by spasmodic pain than by inflammation. There may be occasional pain at the pit of the stomach, or on the right side, rather than constant pain and tenderness; and in that case the hot-bath and opium are among the best means. But in such cases as these, if you find the patient's pulse constantly quick and strong, one of the best antispasmodics you can employ is bleeding. If you find that the pain is not constant,—that it comes on at intervals, and not with a constant severity, you may expect that the disease is, to a certain extent, spasmodic; and there opium and the hot-bath will be very useful. But if there be general tenderness besides, and bleeding be at all admissible, it will answer exceedingly well. It will be more effectual, and much better, to combine the opium with a full dose of calomel. This will prevent constipation, and produce a free discharge from the alimentary canal. In these spasmodic cases, in addition to the common treatment for hepatitis, you should give a large dose of calomel (ten or twelve grains), and a few doses of opium;—perhaps two grains, or more, in a dose. A poultice over the part is also very useful.

This sudden pain with jaundice, is no proof whatever that the

case is one of gall-stones. Where there is no jaundice at all, but where a patient is seized with sudden pain at the pit of the stomach, many persons say he has gall-stones; and if, in addition, there be jaundice, then they consider the matter as certain. But mere spasm of these parts will produce this violent pain, and perhaps giddiness likewise. You may suspect that there are gall-stones, but frequently you have all the symptoms without it; and you have no right to assert that a person has gall-stones, unless you see them pass, or they have been discharged. When you consider that, from eating something which is indigestible, a person will be seized with violent pain at the pit of the stomach, and the next day will have an attack of jaundice, you see clearly that this occurrence may be produced without the presence of gall-stones;—you see that it is obviously caused by something which has irritated the parts.

You will find the greater number of cases of jaundice yield to purgatives, or to the treatment for hepatitis; and if you find such severe pain as I have now mentioned, anti-spasmodic treatment will generally get rid of it. But the disease sometimes lasts a long time, —becomes *chronic*; and it is necessary, after you find no more pain, —no tenderness on pressure, to make the patient move about;—to make him take free exercise, to have the parts well rubbed, to recommend the use of the warm-bath, to exhibit mercury,—so as to produce a mild affection of the mouth, for a greater or shorter length of time,—and to make a free use of purgatives. When the disease has become chronic, it will frequently go away under the use of these means. The parts seem to fall into an atonic state. Supposing that the affection continues in spite of all these means, then you will generally have reason to suspect that there is disease of the liver. If you find induration or enlargement of the organ, or a degree of ascites, or any kind of dropsy; if you find persons waste more and more; and especially if you find the tinge become green, after having been the plain ordinary yellow;—then you must form an unfavourable prognosis, and suspect disease of the liver. In the case of enlargement and induration, it is pretty well proved; and then the remedies for diseased liver should be employed. Setons over the part, and the exhibition of iodine, will be the best means that you can employ; and you must keep up the patient's strength, as well as you can.

With respect to this chronic jaundice, there is a curious case which I stumbled upon in Van Swieten's work; where it was cured by making a man imitate Nebuchadnezzar. Van Sweiten says that he persuaded a poor man, in an obstinate case of jaundice, to live upon grass for two years, except during that part of the winter when there was none to be got. He made him eat the tenderest grass, and also that which was first mowed; and he made him take that which was in flower. The man "confessed that, for some time, this diet did but little please him; but after a time he was well contented, and could easily distinguish the best pastures by the flower of the grass." This I can imagine. At last he became a general nuisance

to the farmers; for they found that he had so large an appetite, that they drove him first from one field, and then from another. This is Van Swieten's own account. He says he was obliged to eat his diet secretly; and that the farmers, finding he had so large an appetite, often gave him a quick repulse. The man, however, was perfectly cured.

BILIARY CALCULI.

It may be well to say a few words respecting gall-stones. We can do nothing to dissolve them; but when they are passing, we may mitigate the patient's pain. It is said that, when they pass, the pulse is not quickened, as in inflammation; but that, on the other hand, it frequently becomes slow. I believe that this is generally the case; but the same circumstance will occur in a case of pure spasm. Sometimes, however, the pulse is increased to above a hundred; there is sudden pain in the part; and there is vomiting. Sometimes there is *great* pain, which is relieved by pressure;—it is mere *spasmodic* pain. Sometimes there is shivering. The patient has no increase of temperature; and the treatment will be the same as that for spasm; because you cannot say whether there is a stone or not. But if the patient have passed gall-stones before, and the same symptoms occur again, then you are authorized in concluding that they arise from gall-stones.

These stones are found in the ducts of the liver itself; they are also found in the gall-bladder, in the cystic duct, and in the ductus communis choledochus. If they exist in the cystic duct, of course they will not produce jaundice, unless they happen to be so large as to press upon the ductus choledocus, or the hepatic duct; but though they will not produce jaundice, yet they will obstruct the course of the fluid from the gall-bladder; and it will become distended, to a great amount, by its own secretion. There is, at St. Thomas's Hospital, a very extraordinary specimen; in which, from an obstruction in the cystic duct, the bladder went on secreting mucus, till at last there was what is called dropsy of the part; but no obstruction of the cystic duct can produce jaundice. There must be obstruction in some of the ducts of the liver,—in the hepatic duct, or in the ductus choledochus,—in order to produce jaundice; but gall-stones, are found in all parts;—not only in the cystic duct, but in the gall-bladder itself.

Gall-stones are seen of all sizes;—from mere grit, to the size of the gall-bladder itself. Gall-stones will very often pass without any pain at all; for I have found them in the motions, without any pain having occurred. If they are very large, they will occasionally produce no pain;—provided they lie still, and do not attempt to escape; but if nature make an attempt to get rid of them, the pain is very considerable. Dr. Heberden mentions that, in the gall-bladder of Lord Bute (the preceptor to George the Third), a stone was found which weighed two drachms; and yet that it caused no symptoms. They were surprised to find the stone there. The *quantity* of stones

found will vary, from one to an immense number. It is said by Dr. Baillie, that a thousand have been found at once in the gall-bladder. The preparation is now to be seen in Dr. Hunter's collection. An incision is made into the bladder, to shew that it is crammed full of stones. Dr. Baillie has given a representation of the case. I once took out of the gall-bladder of a patient at St. Thomas's Hospital, between three hundred and four hundred stones; which had given rise to no symptoms during life. The patient had not complained of the least pain; nobody knew that there was any thing extraordinary in his inside; and he died of a very different disease. Nothing is more common than to open persons who have died of disease unconnected with the liver, and who have never complained of a pain in the side; and yet to find several gall-stones.

These biliary calculi are sometimes rough, and sometimes smooth. They acquire a smooth surface from lying and rubbing against each other; but then this very same circumstance causes them to be angular. They have a sharp corner and edges; although the surface between the angles may be perfectly smooth. Those in the centre are generally oval; and Dr. Baillie says that he saw one the size of a hen's egg. They will pass through the ducts even when very large; for the ducts will dilate incredibly. We know that the female urethra may be dilated to so great an extent, that a large stone may be extracted from the bladder, without an incision. A very large calculus has been known to pass through the ductus communis choledochus, without ulceration having been discovered after death. I mentioned that Dr. Heberden states, that once the ductus communis was distended to an inch in diameter; but not unfrequently, when the stones are large, they will escape by an abscess,—just as pus will do from the liver,—either externally or internally. Adhesions may take place externally, between the gall-bladder and the parietal peritoneum. An abscess forms; and the stone comes out through the abdominal parietes. But, more frequently, adhesions take place between the bile-passages and the intestines; into which the stones escape, and are discharged by stool.

It is astonishing how very large a calculus nature will get rid of, and yet the patient do well. A calculus two inches and a quarter in length, three and a quarter in circumference, and weighing one ounce, two drachms, twenty-three grains, was discharged from a person, who lived after it, and did perfectly well. The case is recorded by Dr. Letsom, in the first volume of the "Transactions of the Medical Society of London." Dr. Pemberton states that a stone has been discharged, two inches and a quarter in length, and one inch and a quarter in breadth. In the "Medical Gazette" for March, 1828, there is an account of a stone an inch and three quarters in length, three inches and a quarter in breadth, and weighing two hundred and seventy-eight grains. A stone measuring an inch and three-eighths in length, and three inches and three-eighths in transverse circumference, is mentioned in the twelfth volume of the "Medico-Chirurgical Transactions." It had passed by ulcera-

tion; but the individual died. There is a curious instance of one an inch and six-tenths in length, and an inch and one-tenth in breadth, which was expelled, and the patient recovered. As it went down the intestinal canal, it stuck in the sigmoid flexure of the colon; and there gave all the signs of strangulated hernia;—so that, before its escape from the intestines, it did serious mischief. Yet there had been no suffering previously. It was not known that the cause of the disease was a stone.

These calculi are most frequently found in the gall-bladder itself; next to that in the cystic duct; next to that in the ductus choledochus; and next to that in the hepatic duct. There can be no doubt, therefore, that they are generally formed in the gall-bladder itself. Some of them are white, others are black; some are black externally, and white internally; and some have a shining and semi-transparent fracture. As to their constituents, some of these stones appear to be nothing more than inspissated bile; and these are bitter to the taste, soluble in water, and burn to a cinder. But the greater part of the biliary calculi are not of this description. They are of an oleaginous character; and if you melt them, they will take fire, and burn like wax. The shortest way to ascertain their nature, is to scrape them a little; and they very soon melt. Some are resin, some are cholesterine, and some are picromel.

Now those kinds which are waxy (I only use the word in the common vulgar acceptation,—meaning "to burn like wax"), are of a greasy character, are laminated within, and are frequently crystallized. Sometimes, however, they are oleaginous. Generally they are in plates,—laminated; but sometimes there are crystallized radii, passing from within outwards. Occasionally they are a mere amorphous mass. Now and then they have been found to contain phosphate of lime; but when stones in these parts contain this material, it is doubtful whether they are biliary concretions. Two cases of this kind are related by Andral; but there had been such obstruction, that no bile could have entered the gall-bladder, for some time. The cystic duct was obstructed; and calculi appear rather to have been the result of a secretion of the inner surface of the gall-bladder;—just as stones may be found in the urinary bladder.

DISEASES OF THE GALL-BLADDER.

With regard to diseases of the gall-bladder itself, I may mention that it is rarely ulcerated. Occasionally its coats are very thick; occasionally it is hypertrophied; and it has been known to be completely ossified. Sometimes it will waste away; sometimes it will have tubercles in it; and sometimes there are hydatids in its substance. Now and then it has been ruptured. A woman came one day to St. Thomas's Hospital, and fell down dead; and on opening her, the gall-bladder was found to have been suddenly ruptured. Death, I understand, took place instantly.

DISEASES OF THE STOMACH AND INTESTINES.

Before I commence the consideration of particular diseases of the stomach and intestines, it may be advantageous to give a short general account of the morbid appearances observed in this part of the body. But, in the first place, I shall direct your attention to the varieties which are observed in the *natural* state of the parts;—according to the portion of the canal which you examine, and according to the age of the patient. If you examine the inner surface of the stomach and intestines of a living animal, that is making no effort at all,—so that its circulation is perfectly free, that surface is found to be rather redder than the inside of the cheeks;—the mucous membrane of the former, is rather redder than the mucous membrane of the latter. In some animals, after death, you will find the mucous membrane pale, or at the utmost only slightly coloured; but here, again, much depends on the mode in which the animal dies. If you kill it by asphyxia,—that is to say, if you kill it by putting a stop to respiration, these parts will become of a very red colour, or very dark; and there will be great congestion of blood. But if, on the other hand, you kill the animal by hæmorrhage, these very parts will look paler than they were during life. The internal surfaces of the body, are liable to exactly the same changes of colour as the outer. You know that, if a person die from strangulation, the surface of the body will perhaps be of a dark colour,—more or less red; whereas, if he be bled to death, he will become pale. Now we are to generalize these changes; and be prepared to expect circumstances quite analogous in the inner surface.

If we look at the stomach during digestion, or if we look at the inner surface of the upper part of the small intestines during chylification,—when their great function is going on,—we shall find the parts redder than at any other time. This, of course, will occur at different periods of the day;—according to the shorter or longer time that has elapsed, since food was taken into the stomach. Any obstruction to the return of the blood, will make these parts redder than they should be; and perhaps darker. Hæmorrhage may take place from the inner surface of the stomach, or from the inner surface of the intestines,—from the great accumulation of blood; and as impediments to the circulation are very common just before death, you, more frequently than not, find these inner surfaces red and dark-coloured;—at any rate, *partially* so.

I believe I mentioned formerly,—when speaking of deceptive appearances with regard to inflammation,—that you may produce these changes at pleasure, accordingly as you examine a body a *longer* or a *shorter* time after death;—having first placed a certain part in a dependent situation, so that the blood may gravitate in a certain direction. If you place a certain portion of the intestines in a dependent situation,—lower than the rest, the blood will of course gravitate to it; and if you allow a long period to occur before you examine the intestines again, according to the length of that period

the situation of the parts, and the quantity of blood in the body, will you (cæteris paribus) find them darker. From the natural arrangement of the parts, you will generally find that those portions of the intestines which are in the pelvis, are of a darker colour than the others; and you find that the *posterior* surface of the stomach, is darker than the *anterior*;—merely from the gravitation of the blood; and, of course, darker and darker will the appearance be, according to the length of time before you make the examination. If the examination be delayed for a great length of time,—so that decomposition takes place in any degree, and the blood is allowed to transude from the blood-vessels, you will see extensive patches of red; and you will see stains along the course of the veins;—just as you observe on the external surface. If a still longer period transpire, you will have the whole of the parts red together. If the blood completely transude from the vessels, it will dye the whole substance; and from the solid portions being decomposed,—melted down into a mass, you will actually find more fluid than the blood itself will afford.

In persons in whom the intestines have been diseased during life, you will find them of a paler hue lower down, than higher up. The lower down you examine them, the greater generally is the paleness. They are also pale in youth, and in the young adult period; but in the fœtus, these very parts are naturally of a rosy hue; and in old age they are of an ash-colour; and not only so, but the veins are seen to be very large. These are the chief varieties as to *colour*.

But we must recollect that there are, likewise, different appearances, with regard to *thickness*. The mucous membrane is naturally thickest in the duodenum, and thinnest in the colon; and the mere circumstance of an accumulation of blood, just before death, or after that event, will occasion it to appear thicker than it should be,—without any disease of that particular part; while it always appears thinner in persons who die in a state of anæmia,—who are bled to death, or who have not rallied a little for some time before death, or who die suddenly in an emaciated condition. There is a great difference, too, in the *consistence* of the mucous membrane in different parts. Generally those which are by nature *thickest*, are also by nature *firmest*. At the pyloric end of the stomach, you will find the mucous membrane always thicker in health, and more consistent, than at the other extremity; and it is a natural circumstance for the mucous membrane to peel off, in large portions, from the inner surface of the stomach.

The consistency of the mucous membrane varies, according to the time at which you make the examination. It always becomes less, in proportion as time elapses after death; and, more particularly, if the surface of the stomach be exposed to the air. If it have immediate contact with the air, it loses its consistency much more quickly than it otherwise would. It is also exceedingly variable,—according to the quantity of gastric juice which the stomach contains; for the gastric juice will soften the inner surface, and indeed the whole stomach.

This softened state has been seen, very frequently, in persons who have died in perfect health. Where they have been suddenly destroyed by mechanical violence, or by any violence not acting till the moment of death, the mucous membrane of the stomach has been found softened; whereas, in persons who have been weak, and in whom you would suppose such softening might occur from disease, you continually find no such appearances. It has also been found, that not merely the mucous membrane, but the whole of the coats of the stomach together, have been softened in these circumstances; and even perforation has taken place; and still further effects have been observed in the other abdominal viscera, from their immediate contact with the part in which perforation took place. On this account it was supposed, by John Hunter, that the gastric juice will not act on a *living* part; but that it has the power of acting on *dead* animal substances; and that, therefore, it will act on the stomach, when life is no longer present to resist it. There has been a great difference of opinion on this point. When it was first promulgated, it was doubted. It was afterwards believed; but many French writers again doubt it; though I believe we shall see no good reason to suppose it doubtful, if we consider that, at the same time, the parts of the stomach, with which the fluid comes in contact, are softened; and it is singular that this softening particularly takes place at the posterior part,—where the gastric juice must chiefly have gone. Thus we may have considerable morbid appearances, without any previous disease;—simply from the effect of the gastric juice. At any rate, it is considered that, when the stomach is softened, we may be justified in saying, that the appearances are simply the effect of death;—whether the individual was in health before, or died from an affection of the stomach; and whether it is at the posterior end of the stomach or not; and whether, at the perforation, the parts are rubbed off or not.

Many morbid appearances take place in the intestines, particularly in the mucous follicles. We are to remember that, in children, the mucous follicles are, proportionately, more distinct than in adults. You will remember that, with regard to hypertrophy of the heart, I mentioned that the walls of the left ventricle are naturally thicker in children, than in adults; and many parts in children have been supposed to be hypertrophied, when the greater proportionate thickness of them was simply a natural circumstance. Now the mucous follicles, as I have just observed, are much more distinct in children than in adults. In fact, in healthy adults, they are not particularly seen, except in the cœcum and duodenum; and sometimes, again, at the lower part of the ileum; but in children they are generally distinct enough, through the whole length and breadth of the intestines. These mucous follicles are often seen to be very large after diarrhœa, and other diseases attended by irritation in the alimentary canal; but sometimes they certainly are very large, without our knowing that the individual had suffered any previous disease of the alimentary canal.

There can be no doubt that a degree of inflammation may exist in the alimentary canal during life, and yet leave no marks after death. It may happen that the bleedings which were instituted, have taken away the redness of the part, and left it perfectly pale; although the powers of life were destroyed by the disease, or (as in some cases) by the remedies. At any rate, it is possible for the disease to kill; and yet for no redness to be discovered after death. We see a similar occurrence upon the surface of the body, when patients have had erysipelas at the time of death. It is not uncommon to see the parts far less red than during life; and perhaps they are not red at all. Again, we see that redness may exist in all these parts, without any inflammation whatever;—that it may be the result of decomposition, or of some mechanical impediment. If the redness be of an inflammatory nature, or if it have been produced by inflammation, it ought to exist in the minute vessels; but still it is to be remembered that redness may occur there, as well as in the large ones, from mechanical obstruction. If the redness exist only in the larger vessels, it is mere congestion; which may arise from many causes, independently of inflammation. If you see mere over-distention of the *large* vessels, that cannot be considered inflammation; for if it were, it ought to exist in the *minute* vessels. But even though congestion of blood should exist in the latter, it would not be a sufficient reason for its being inflammation. When the redness arises from inflammation, the large vessels may be over-distended too; but in inflammation, the *small* vessels are *first* overcharged, and ultimately the *large*; whereas, in mechanical obstruction, the *large* vessels are first overcharged, and ultimately the *small*.

The redness may affect the mucous membrane simply in its continuous surface, or it may affect the villous coat, or it may affect the follicles, or it may affect two or three of these parts together. If it affect merely the villous coat, you have simple red points; and it is in the stomach and lower part of the ileum, that you chiefly find this inflammatory redness. This redness is of all degrees of shade. The villous coat may be transparent or not. If it be the follicles which are inflamed and red, there are frequently red circles around them; and perhaps also on the summit. If these widen and form a border, you have the follicles of a uniform redness.

The mucous membrane is sometimes found thickened; and sometimes it is firmer than usual, and will peel off in large portions. If this occur any where, it is sure to be met with in the stomach, and large intestines. When it is hypertrophied, sometimes it is as smooth as usual; but sometimes it occurs more at one spot than at another; and you will have the mucous membrane exceedingly rough;—that is to say, the hypertrophied parts being very partial, the membrane becomes rugged. It is polished enough; but still it gives a feeling of ruggedness;—it has depressions and elevations. Sometimes the hypertrophy is such, that portions hang into the canal;—you have it really in processes. When it is hypertrophied, there are various degrees of consistency, and various degrees of

colour. Sometimes, along with the hypertrophy, there is great irritation, and a great accumulation of blood. Occasionally you will have hypertrophy of the villi, and sometimes only of the follicles;—the follicles will be enlarged. When the latter occurrence takes place, sometimes the orifices of the follicles will diminish; and if they diminish, they will at last close, or nearly so; and then the secretion accumulates beneath, and dropsy takes place. If the contents happen to be solid, of course you cannot apply the word "*dropsy*;" but the follicles are distended with a soft, thin, caseous substance. Occasionally the mouth of the follicles increases very much. Sometimes they increase by ulceration; and these overgrown follicles are generally seen, like all other morbid appearances, at the lower part of the ileum, where the ileum ends in the colon.

Sometimes it is not the mucous membrane which is hypertrophied, but the cellular membrane under it;—the sub-mucous cellular membrane. Occasionally it becomes very bulky, or very hard. It falls into a state of scirrhus, and becomes as hard as cartilage. The disease which is called *scirrhus*,—a specific induration and hypertrophy,—frequently takes place. Sometimes, when it has begun there, the membrane on the other side becomes hypertrophied too; but I believe that when scirrhus affects the alimentary canal, it is the cellular membrane under the mucous membrane, that is first attacked. The other coats will sometimes remain healthy for a great length of time; but hypertrophy, ulceration, and other diseases, may take place. This particular affection of the sub-mucous cellular membrane, is very commonly seen at the pylorus; but it seldom takes place, except after the middle period of life has passed. In this affection, it is common for the orifice of the pylorus to become lessened; and the stomach behind frequently acquires an immense size. If hypertrophy and induration (true scirrhus) take place in the small intestines, it generally gives rise to stricture. The canal of the intestines where it is situated, will be diminished; so that stricture is the consequence. You may have a stricture from other causes; but this is a frequent source of it. This change is rarer in the small intestines, than in the stomach; and rarer in any part of the large intestines, than in the rectum. The rectum comes next to the stomach, in point of frequency of this affection.

Occasionally the reverse change takes place. Instead of the alimentary canal being *hypertrophied*, it will become *atrophied*;—it will become much thinner than natural. The coats will waste away. I do not mean that they will be destroyed; but they will become thinner and thinner, until the alimentary canal becomes quite transparent. Atrophy most commonly occurs at the splenic end of the stomach; and, next to that, at the lower end of the ileum.

Then, again, these parts sometimes *soften*. It is the mucous membrane that is, most frequently, the seat of this disease;—it will become quite pulpy. There are all degrees of softness, till it is absolutely lost; and the disease exists in various directions. When the mucous membrane becomes softened, sometimes the colour is

quite natural, sometimes it becomes pale, sometimes it is a dead white, and sometimes it is blue;—just as, you will recollect, is the case in the brain. I pointed out that, when the brain is softened, there is sometimes great blueness of the parts all around. The change of colour in the intestines, is sometimes produced by the loss of vital energy; and sometimes it is the result of inflammation. This softening is very common after chronic diseases;—after phthisis, for example. Sometimes, where we find this softening to be very great, there has been nothing more than anorexia (loss of appetite), and some degree of indigestion. It is common to find this state where persons have been dyspeptic. This affection is, in other respects, similar to the softening of the brain. Occasionally it is *acute*,—takes place rapidly and suddenly; and occasionally it appears to be a very *chronic* change. When it takes place as an acute affection, there is generally a red tongue and vomiting; but sometimes I have seen it where the patient, a short time before, was in perfect health. The same circumstance has been observed, with regard both to the stomach and to the intestines. Sometimes, in the case of the intestines, the disease follows diarrhœa.

This softening, though it is most usual in the mucous membrane, may extend to all the coats; and the intestines may look just like jelly. At first sight they may appear healthy; but when you come to examine them, you find them like so much jelly. This general softening of the stomach, is most frequent in the splenic end; and I presume that, very frequently, it really results from the operation of the gastric juice; but that, I imagine, is only one cause of the disease. Cruveilhier has given some good representations of this disease. In these cases you may brush the membrane all away. This softening is not to be ascribed to any decomposition of the part. In the case of the stomach, no doubt, it will arise from the gastric juice; but if it occur in other parts of the alimentary canal, it must be supposed to have taken place during life; for the intestines do not become soft by decomposition, unless a considerable degree of time has elapsed. The *brain* will soon become soft; but the *intestines* retain their consistency for a considerable time.

Some experiments were made at Stutgard (at least, cases were published there) in 1818, upon the effect of the gastric juice in producing this softening. Animals were examined before putrefaction had taken place, and the softness was seen in many cats and dogs; so that it appeared to arise from the gastric juice. If they were allowed to remain till putrefaction had taken place, even then there was not more softening, than in those which were examined sooner. The fluid taken from the inner surface of the stomachs of two children, who had died with this softened state of the mucous membrane, was introduced into the stomach of some dead adults; and it soon caused a solution of the solids; whereas, when it was put into the stomach of a live rabbit, it had no effect. I consider this a great confirmation of John Hunter's opinion;—that this softening of the stomach is mainly attributable to death. but it is said, that if the

eighth pair of nerves was divided,—so that the powers of the stomach were impaired,—then the gastric juice occasioned softening during life;—exactly as it did in *dead* animals. If these experiments were correct, they were exceedingly curious. There can be no doubt that common softening of the stomach and alimentary canal, is sometimes the result of inflammation; for we see symptoms of gastritis during life, and signs of inflammation after death. But gelatinous softening of the stomach, is frequently seen in children, who have not suffered from inflammation; but who have been in a general ill state of health;—who have been weaned when they were not able to bear it, and have not been supplied with proper food afterwards. Thus it appears occasionally in a cachectic state; and very often the parts all around are perfectly healthy.

I will now say a few words respecting *ulceration* of the alimentary canal. This is found most frequently in the two lower fifths of the ileum; and with respect to the large intestines, it is seen more frequently in the cæcum than in other parts. It is seen more frequently in the stomach, than in the jejunum, or the duodenum; but it is seen in all parts of the ileum more frequently than in the stomach; and it is seen more frequently in all parts of the large intestines, than in the two upper fifths of the ileum. This ulceration may exist in the centre of inflammatory spots, or in the centre of red patches. Sometimes we find diffused redness. A long tract of the intestines will be red; and we observe ulceration here and there. Occasionally ulceration occurs in parts more or less melted down; and frequently it takes place in hypertrophied follicles;—both in the glandulæ solitariæ, and in the glandulæ aggregatæ. With regard to the glandulæ solitariæ, when they enlarge and do not discharge their contents, they become distended, and are more or less firm;—so that they acquire a conical appearance. They then lose their conical form, and have a central depression on their top;—exactly like a variolous pustule. Their orifices sometimes simply enlarge; sometimes they ulcerate down merely to the level of the mucous membrane; sometimes they ulcerate below it; and then, if they run into each other, you have a frightful ulceration. Of course the ulceration may go on, till the alimentary canal is perforated;—till there is a way through it into the cavity of the peritoneum. Ulceration, like softening, may either be an *acute* or a *chronic* affection. Occasionally we see ulceration in the midst of gangrene. Gangrene is a rare occurrence in these parts; but occasionally there is ulceration and gangrene all around. Sometimes we see ulceration of scrofulous tubercles. There are scrofulous tubercles deposited under the mucous coat, in the cellular membrane; and sometimes we see them under the peritoneal coat, and cellular membrane. In this situation they will enlarge, ulcerate, and go through the same process as in the lungs. It is rare to find them ulcerate outwards, towards the peritoneum; but I have seen a few instances of this occurrence. Most frequently the tubercles ulcerate through the mucous membrane into the intestines. This is sometimes seen in phthisis. There has been a minute

abscess in the cellular membrane, under the mucous coat; and the latter has ulcerated through.

Ulceration is seldom the effect of acute inflammation of the *stomach*; but it is a common result of inflammation of the *intestines*. The ulceration is sometimes solitary;—you see only one ulcer; but sometimes there is an infinite number. In the stomach, however, they are seldom numerous. They are of all sizes; and they take all directions. Some extend down the course of the canal; and some transversely. Then, as to the edges, you find them just as various. Sometimes they are natural; sometimes they are very thick; sometimes they are very hard; and sometimes they are very soft. The nature of the ulcerations depends upon the depth of the ulcer. If only the mucous membrane be ulcerated through, the case is very different from what it would be if the cellular and muscular coats were ulcerated too; for then you would have peritonitis. There is no proportion between the depth and the length of the ulceration. The intestine between the ulcerations may be in various conditions. Sometimes it is healthy, sometimes it is unhealthy. Not only the mucous, but the cellular coat underneath, varies much as to its condition.

There is no doubt that these ulcers will heal;—just like ulceration in other parts of the body. Every now and then you will find ulcers in the intestines in various stages. Some are open ulcers; some are half cicatrized; and others are *entirely* cicatrized. You will find portions of the intestines which have evidently been in a state of ulceration, but which have healed; and it is very interesting to meet with an ulcer half healed; for then there can be no doubt of the nature of the affection.

Persons who are not known to be particularly ill during life, are sometimes found, after death, to have an ulceration in the intestines, or stomach. They have had some little illness; but perhaps no one knew of it;—they were in apparent health, when they were suddenly seized with violent pain in the abdomen; and they died from perforation having taken place, and peritonitis being set up. Occasionally this takes place where the patient is labouring under some other disease in the abdomen;—that disease not having been known to exist; but, more frequently, it occurs where persons have suffered from a gastro-enteritic affection. Mere softening will produce a perforation;—just as ulceration will do; and sometimes a slough will give rise to the same circumstance; though that is very rare. In brutes, perforation has taken place; and the coats of the intestines have sometimes lost their continuity by distention, occasioned by gases. In horses, this has been known to take place in consequence of vomiting; for vomiting will not occur in them, unless there be such a violent effort as is dangerous to animal life. It has occurred in human beings when the stomach has been diseased. If the stomach be thin, mere vomiting has sometimes caused perforation. Perforations, from these various causes are seen, most commonly, in the stomach, and particularly at the lower end of the

organ. There can be no doubt that some perforations take place after death; but when they do not, there is generally violent peritonitis.

Blows on the abdomen will sometimes rupture the stomach and intestines. You would suppose that, in all cases where violent peritonitis took place from this circumstance, the contents of the stomach would be effused; but that is not the case. It is said that sometimes, very little irritation has been produced, and only chronic peritonitis. But I believe the cases must be very rare;—at least, I have never met with one. Sometimes the opening has been completely blocked up by nature, by means of a piece of omentum or something else; and no mischief has occurred. Sometimes adhesions have taken place, and a fistulous opening has been the consequence; so that some persons have discharged the gastric juice from their stomach, while others have had an artificial anus. You know that, in the case of the rectum, these perforations will occur; and we have what is called *fistula in ano*. Sometimes one portion of intestine will perforate into another. Two portions lie together; nature produces an adhesion; one of them becomes perforated; and an opening takes place in the fellow convolution. Occasionally the intestinal canal has been seen perforated from without. When an abscess occurs in the liver, or a stone from the ducts or gall-bladder has got into the intestines, these parts will become perforated from without. Various tumors have been known to ulcerate into the intestines.

GASTRITIS.

Gastritis, or inflammation of the stomach, is characterized by an acute and constant pain at the pit of the stomach. This pain is increased on the slightest pressure; and it is likewise increased on swallowing any thing;—particularly if it be hot, or acrid. There is generally also,—provided the disease is violent,—a great sense of tightness across these parts. These symptoms arise simply from the *locality* of the inflammation; but there are others dependent on the *function* of the part which is inflamed. You have nausea, retching, and even vomiting itself;—especially when any thing is swallowed. Sometimes you have also hiccup (singultus). There is generally experienced a burning sensation; which, for the most part, extends up the œsophagus, and is felt even in the pharynx. It is not uncommon for the epigastrium itself (the external portion of that part of the body in which the inflammation resides) to be hotter than the rest. There is generally thirst, great anxiety, and not unfrequently a feeling of great debility. The pulse is quick, small, and perhaps hard; but there is a great variety in this respect;—just as you observe in inflammation of other parts. The acute form of gastritis, if it be violent and not speedily remedied, soon proves fatal.

You are carefully to remember that, very frequently, this disease is preceded by merely a spasmodic pain of the part. It is not uncommon (as I shall mention particularly when speaking of what is called "disorder of the digestive organs") for persons to be seized

with sudden pain at the pit of the stomoch;—running through the back; affecting respiration; drawing the patient together; perhaps relieved, at any rate not increased by pressure; not attended by a sense of heat, but perhaps by a sense of cold; and unattended by any great thirst. So far from the pain being increased by heat or stimuli, it is generally diminished by them.

This is evidently a state of spasm; but after it has existed for a longer or shorter time,—if it be not remedied, or if it do not cease spontaneously,—it very frequently degenerates into, or gives rise to, or is followed by, inflammation of the part. You will then find the treatment you were at first adopting, highly improper. The administration of stimuli does harm; and if you omit the common treatment of inflammation, the patient is very liable to slip through your fingers. You are carefully to remember, therefore, that you have two descriptions of pain attacking this part of the body;—the one entirely spasmodic, the other inflammatory; but that the spasmodic very frequently terminates in an inflammatory state.

Gastritis is produced, in the first place, by the common causes of all inflammations; cold applied to the body,—especially when the body is heated. Sometimes it is produced by cold applied to the inner surface of the stomach, when the body is over-heated. Sometimes, when a person is very hot and takes cold drinks, before inflammation comes on there is a state of extreme debility. Occasionally the power of the stomach seems almost destroyed; the person is very faint; the pulse is small; and sometimes death ensues without any re-action taking place. You will hear of ladies dying suddenly, when they have been drinking cold water, or eating ices, while they were hot. The danger does not arise simply from being hot; for the hotter you are, the more good does cold do; but it arises from the person being exhausted. It is not even the simple circumstance of sweating, that makes it dangerous for a person to go into the cold bath, or to roll himself in the snow,—which the Russians do when there is no necessity for it; but it is the circumstance of the individual being exhausted, that makes the abstraction of all stimuli dangerous. If you meet with a patient who has an affection of the stomach from exhaustion, the best mode of treating it, is to give a large dose of opium, together with stimulants. If the person recover from this state, it is possible that inflammation may not arise. But sometimes, without such a depression as this, the application of cold to the surface when the body is exhausted, may produce inflammation;—just as in other cases. The external application of cold may produce inflammation of the bowels. Occasionally gastritis is produced by the sudden cessation of gout. When gout suddenly ceases in an extremity, inflammation of the stomach will occasionally arise, and that of a very dangerous character. But another state of the stomach is frequently induced in these circumstances;—namely, a violent spasm of the part (gastrodynia);—a state to be treated, perhaps, by brandy. Gastritis sometimes occurs sympathetically with an affection of the kidney;—when the kidney

is severely affected in various ways. When a stone is on its passage from the kidney, the stomach generally sympathizes; so that vomiting occurs, and sometimes real gastritis takes place. It will sometimes arise from sympathy with the state of the womb. The womb, when diseased, frequently gives rise to nausea and vomiting; and sometimes the irritation may amount to inflammation. This state is very often induced by the passions of the mind. A sudden emotion of the mind, of a very disagreeable character,—great grief,—sudden surprise of an unpleasant description,—a sudden and severe shock,—will sometimes give rise to a spasmodic pain here ("spasm of the stomach," as it is called); and sometimes to actual gastritis. Great fatigue will have the same effect. Of course it is a disease that is easily produced by any acrid matter. Many poisons, properly so called, produce inflammation of the stomach; but any acrid matter whatever, or any stimulus, properly so called,—such as a large dose of cantharides, or corrosive sublimate,—or any thing else that can irritate the stomach, may produce gastritis. It occurs likewise in other diseases. In fevers, gastritis of more or less intensity is very common. You will recollect I mentioned that, in the fevers of hot countries, there is a burning heat at the pit of the stomach,—deserving the name of active acute gastritis.

On inspecting the stomach after death, the redness is very seldom universal. It is very seldom that the whole of the inner surface of the stomach is inflamed. Sometimes this is the case; but generally it only takes place at a particular part. When peritonitis exists, that portion which covers the stomach may be inflamed,—the same as any other part; but in general gastritis, properly so called,—gastritis independent of inflammation of the peritoneum,—merely produces local effects on the mucous membrane of the stomach; though occasionally it extends to the cellular membrane between the coats. This disease very seldom induces gangrene. I never myself saw such a thing; but occasionally gangrene does take place. Very seldom does it produce abscess; but occasionally an abscess has been found between the coats of the stomach. You are more likely to meet with gangrene of the stomach after acrid substances have been applied, than in any other circumstances. If caustic substances have been taken, then you may expect gangrene. A slough is produced, which may or may not be thrown off.

You must carefully remember, that this disease may arise from acrid or poisonous matters introduced into the stomach, without your being able to discover any trace of them. It is very possible for a patient to have vomited every thing which he took, or for the ingredient to have passed into the intestines, and so to have escaped from the body; and yet sufficient inflammation may have been induced to destroy life. Although it is very possible that death may ensue from things taken into the stomach, yet you are never justified in saying that inflammation of that organ,—that the various morbid appearances which you see there, have been owing to poison, unless you prove its presence;—unless you discover it in what has

been vomited;—unless you find it contained in the alimentary canal, or in what has been discharged, or in a vessel of the contents of which the patient clearly partook. If it were not for an accurate knowledge of this circumstance, you might suspect that poison had been taken, without there being any justifiable reason whatever for the opinion; for the appearances within the stomach, may be precisely the same as those induced by taking poison, or some other injurious matter; when it is simply common inflammation, and the effects of it.

As to the *treatment* of the disease, the first point is undoubtedly to discover the cause. It is of very great importance to know whether the disease has arisen from any thing taken into the stomach or not; because, if it have, your first object must be either to effect its removal, or to neutralize it,—to destroy its power. I need not say, that the most ready mode of emptying the stomach, is to employ a stomach-pump. This is much better than giving an emetic; because emetics add to the irritation, or they may fail. The most powerful medicines are those of an acrid kind. Sulphate of copper is one of the best; and, next to that, sulphate of zinc. These operate immediately, and produce little nausea. Ipecacuanha produces great nausea, and may not effect the purpose after all;—at least, there is less probability of its succeeding, than in the case of sulphate of copper. When you have recourse to the stomach-pump, it would be as well to employ an antidote. If a poisonous acid have been taken, it is better to pump in *magnesia*-water than *plain* water; but if an alkali have been swallowed, then you should have recourse to diluted vinegar. The best plan, in all cases, is to fill the stomach with warm water;—to pump it *in*, and pump it *out*, till the fluid comes out quite clear, and you are satisfied that nothing remains. Provided a stomach-pump is not at hand, an emetic should be had recourse to; but notwitstanding you have done all this, and emptied the stomach immediately, you will find it of the utmost importance to go on treating the gastritis, as though you had done nothing of the kind. After arsenic or corrosive sublimate has been taken, and the stomach has been washed out, and there is no fear from the immediate effects of the poison, gastritis may nevertheless exist, and destroy the patient; or, at any rate, produce great danger; and you must have recourse to the common treatment of gastritis.

When the disease arises from simple cold, or after poisons, it may be necessary to bleed generally or locally. Cupping can hardly be borne; but leeches should be repeatedly applied over the part; and when you cannot employ them any more, blisters should be had recourse to. You find it grateful to the patient to allow cold drinks; and there can be no objection to ices. There is intense heat, and a great sensation of thirst; and the greatest comfort imaginable seems to arise from cold draughts. The best plan is to consult the patient's feelings. If he like cold drinks, let him have them; or if he like ices, there is no reason why he should be debarred from them. You should follow the same rule as in inflammation of the surface;—change these *cold* drinks occasionally for *warm* ones, and let the

patient regulate the temperature. Of course is is necessary to keep the intestines in a free condition; and I should imagine it would be better to do this by clysters, than by any other means. The stomach should be left as quiet as possible; and therefore I would trust this part of the treatment entirely to injections. With regard to the exhibition of mercury in these cases, I hardly know whether it is necessary or not, or whether it would be injurious or not. I have occasionally administered it where I was afraid that death would take place, without seeing the stomach irritated by it; but if you remove the cause (which is something acrid), and have recourse to bleeding,—if you give the patient cold drinks, and keep the bowels freely open,—the inflammation of the stomach is, in general, disposed to subside.

Inflammation of the stomach is very common in many acute diseases. It frequently occurs in erysipelas; and is sometimes evanescent,—will go away without any treatment, if you keep the patient low; but occasionally it requires local treatment. In fevers you must look out for gastritis. In the continued fever of this country,—properly so called,—and many other acute affections, this disease is very likely to spring up; and therefore, in these affections, you should always, from time to time, examine the state of the abdomen.

Gastritis is much more frequently a *chronic* than an *acute* affection. When it exists in a *chronic* form, the symptoms are much the same as when it is *acute*; only they are less intense. There is a great sense of heat within the stomach, rising from the œsophagus into the pharynx; great thirst; tenderness of the part on pressure; loss of appetite; nausea; and frequent vomiting. The tongue is *generally* red somewhere;—either at the tip, the sides, or all over; but you may have inflammation of the stomach, more or less violent, without redness of the tongue. You must not depend on the tongue alone. You generally see redness of the tongue; but you are not to say that the other symptoms do not shew gastritis, because the tongue is absolutely white, or not much affected. In these chronic cases, there are generally dyspeptic symptoms;—such as a great flatulence, great acidity, and a sense of sinking at the pit of the stomach. The latter is a very common symptom; and, to remove it, people generally take wine and brandy, and make things worse. The want of attending properly to this point, occasions very absurd treatment. I have seen persons, in this affection, have draughts of æther and ammonia, and things of that description;—all of which may be grateful for a time; but which, as patients frequently themselves say, ultimately produce great uneasiness. It is always right, when you are treating dyspepsia, to ascertain whether there is an inflammatory state of the stomach; for that organ may be in a condition requiring stimuli of all kinds; or, on the other hand, requiring the application of leeches, and making all stimuli and effervescing draughts exceedingly improper. Many persons labouring under dyspepsia, clearly have gastritis; for there is great pain on pressure; and because

they feel a sinking sensation, they drink wine and brandy, and eat meat. I have seen them get completely well, by changing their diet,—without taking any medicine whatever; and, in other cases, by applying leeches.

A very slight degree of tenderness at the epigastrium, however, is not sufficient to make it necessary to apply leeches, or to lower the patient. When an individual is subject to violent fits of pain in the stomach (gastrodynia), or subject to occasional attacks, you always find that there is tenderness;—merely from the part being stretched. If you have spasms in the calf of the leg, you find the next day that the part is sore;—merely from the muscular fibre having been stretched; and if you do nothing to make it worse, it will go away. There is no occasion to apply leeches to the epigastrium, simply because it is tender. There has been, for a certain time, an attack of spasm; which has left a little tenderness of the stomach; and you will find it yield best to stimuli;—just as a slight degree of inflammation of the eye, is more easily dispersed by washing it with brandy and water, than by any other means. But if there be much tenderness on pressure, and heat extending up the throat, then stimulating remedies would be improper. It is also to be remembered that a sensation of heat in these parts, generally arises from the quantity of acid in the stomach; and that if you give alkaline substances you entirely remove it; but if you think it right, you can apply leeches also. If, however, you give alkaline substances, (such as magnesia and carbonate of soda), you will find that a much smaller number of leeches will destroy the acid. Frequently this is the result of an inflammatory state; and the best way to cure it is to employ leeches; but to prevent the acidity from doing much harm, you should give antacid remedies; or if there be morbid irritability, such a medicine as prussic acid will be of great service. But of that I will speak hereafter.

Chronic gastritis is an accompaniment of many other diseases;—just as it frequently takes place after *acute* gastritis. You find it very common, in diseases of the heart, for persons to have more or less gastritis; which, if it rise to any amount, aggravates all the other symptoms. You find tenderness on pressure; and this, perhaps, over all the parts; and you find that, some time before, the patient has had disease of the heart. So, again, it is by no means uncommon for a person in phthisis, to have more or less gastritic affection. In various chronic diseases, gastritis will come on from time to time, and requires to be remedied; or the symptoms of the original disease will be increased. It is well to ascertain, from time to time, the state of the abdomen, when the patients are labouring under chronic affections;—the same as when they are suffering under acute.

As to the *treatment* of the disease, it is simple enough. You should avoid stimuli, apply leeches from time to time, keep the bowels open, and remedy acidity.

ULCERATION OF THE STOMACH.

When gastritis has existed any time, it may perhaps ulcerate the stomach. Such an occurrence is by no means uncommon. I know of no symptom indicative of ulceration of the stomach; and have frequently met with it by surprise. I have known that the patient had chronic gastritis; but there was no symptom that led me to suppose that, in addition to gastritis, there was ulceration. The symptoms are the same in both cases;—tenderness, thirst, a sensation of heat there, dyspepsia, and perhaps emaciation. Sometimes you will find pain at one particular part of the stomach; but then you may have that without any ulceration. There is no certain diagnosis. You may fancy it to be the case, but your conjecture may be wrong; and you may find nothing but chronic inflammation.

RUPTURE OF THE STOMACH.

If the ulceration proceed to an aperture, there generally occurs, suddenly, a fresh set of symptoms. There is sudden pain in the epigastrium,—dreadful pain there; and, in a case which I saw, there was also intense coldness; so that the patient held a glass of boiling water to the part, without feeling it warm,—without being at all annoyed by it. He also drank water so hot, that I could not have put it to my mouth. You will find, when I come to speak of dyspepsia, that affections of the stomach are frequently attended by a want of power to generate heat.

This pain, after it has existed for a certain time, is generally followed by peritonitis. You will find a paper on this subject by Mr. Travers, in the eighth volume of the "Medico-Chirurgical Transactions;" in which he states that the diagnosis, in a case of this description, or in perforation of the intestines, would be sudden pain in one part of the abdomen (in the case of the stomach, at the epigastrium) radiating from the part; and he considers that the pain would never cease. In a patient of mine, where there was an aperture of the stomach, the symptoms were these. (I had never seen her before; but she was tall and very spare, and was said to have been long dyspeptic.) One day, after dinner, she was seized with a sudden pain in the stomach. It was impossible for me to tell whether this was more than a spasmodic pain; for it was not aggravated by pressure. I gave her laudanum, of which she took sixty drops: but finding no relief, she took more; and so she went on till, in a few hours, she had taken three hundred drops; and after that the pain ceased. It is not correct, therefore, to say that the pain never ceases. I afterwards found some cases published in France, and also one by Dr. Carmichael Smyth, in which the pain went away; and therefore you are not to be sure that the stomach and intestines are not ruptured, because the pain ceases. After twelve or eighteen hours, my patient again had pain enough; for the whole of the peritoneum became inflamed together. This inflammation could not be removed, and she died. From the particular

circumstance of the suddenness of the pain, the great prostration of strength, the smallness of the pulse, and the sinking of the patient, you may imagine that there has been a rupture of the stomach or intestines; and you are not to imagine it the less because, after a time, the pain goes off. If the patient live long enough, peritonitis occurs, and various symptoms take place;—rendering the case clear enough. You see that, from rupture of the alimentary canal, peritonitis has taken place; and a peritonitis that cannot be remedied; because there is a local disease which keeps it up. I believe I mentioned before, that these perforations sometimes take place without any sudden symptoms;—that, occasionally, *slow* peritonitis occurs, and gradually leads to ulceration.

In these cases of rupture, I should recommend the free exhibition of opium; and, when inflammation comes on, the application of leeches. These measures will lessen the suffering, although you can do no further good.

If the destroyed portion of the stomach owe its condition to an ulcer produced by the gastric juice, you will not find the edges so smooth, as in cases of simple ulceration; for the gastric juice does not act so very locally; but the parts all around suffer, and become soft. I believe that, where the stomach has been injured, after death, simply from the action of the gastric juice, there is a softened state of the parts immediately around. You will recollect that the latter circumstance occurs, particularly, at the splenic end of the stomach; whereas common ulcers take place any where; and in the latter case a patient, previously in good health, speedily perishes. Of course you are aware that, occasionally, notwithstanding that the stomach is ulcerated, yet no serious mischief arises; because nature produces adhesions around the stomach, and glues it to the liver, the peritoneum, or the omentum; so that, although the stomach is perforated, no aperture exists. Of course there is injury from the ulceration; but none from the perforation.

Pus is sometimes found within the coats of the stomach; and sometimes it has been seen diffused throughout the whole of that organ. Between the coats, there has been one sheet of pus; bounded by the peritoneum on one side, and probably by the mucous membrane on the other;—the muscular coat having been destroyed. But sometimes it has been found between the muscular coat and the mucous membrane, and between the muscular coat and the peritoneum. Sometimes one small abscess is formed;—a collection of pus takes place in one particular spot. Pus has been found, it is said, on the inner surface of the stomach; but when you recollect that this part is naturally covered by mucus, and that sometimes this is secreted in a great quantity, one hardly knows whether there is really an alteration in the secretion. Still there is no reason why the stomach should not form pus on the inner surface; and no doubt it does;—exactly like other membranes; especially as it has been found, occasionally, on the *external* surface. It is a very rare thing to find *fibrin* effused upon the inner surface of the stomach; yet

there is not a mucous membrane that may not form fibrin, under violent inflammation. You will find it stated in authors, that occasionally a false membrane (as it is called) has been noticed on the inner surface of the stomach. I believe this most frequently occurs in children. It is *before* puberty rather than *after* it, that fibrin is formed in the œsophagus. If you find a false membrane in the œsophagus, it generally terminates at the cardiac orifice of the stomach. So rare is it for fibrin to be formed within the stomach, that even if the œsophagus has produced it, the false membrane has generally been seen to end at the cardia. A layer of fibrin sometimes occurs in the throat; but it has not often been seen to extend lower than the œsophagus.

SCIRRHUS OF THE STOMACH.

Besides common inflammation and its effects, with which you are now acquainted, the stomach is liable to peculiar structural diseases. Scirrhus, open cancer, encephaloid disease, and melanosis, will occur in the stomach; and will all take place in various parts of it; but they most frequently take place at the cardia and the pylorus. This accords with the general rule that I mentioned;—namely, that the *orifices* of cavities are most frequently the seat of structural disease. When scirrhus exists, there may be pain at the spot which is affected; and that pain may go through to the back, and be increased on taking food. Besides pain, there may be all the symptoms of indigestion; and there may be great nausea and vomiting; so that nothing can be retained on the stomach. If it be the *cardia* which is the seat of the affection, the food is generally rejected immediately. I have seen an instance where, the moment the food reached the cardia, a heaving took place; the patient felt as if he were being destroyed by wind; and he said the complaint was nothing but wind. Sometimes the food will pass the cardia, and be rejected immediately, or five or ten minutes afterwards. But if it be the *pylorus* in which the disease resides, then the food will generally be retained for some time;—perhaps for half an hour, or perhaps more. There is no general rule for the time. There may be pain in the region of the cardia, or pain in the region of the pylorus. In the case of the cardia, you may find great difficulty in passing a probang into the stomach, for there may be a stricture at the part; but when the pylorus is affected, there is not only severe pain in that region, but at last there is a tumor. In that case, there is generally emaciation, and a sallowness of look;—such as I told you might be called *cancerous cachexia*. The vomited matter is sometimes very offensive;—sometimes bloody; and sometimes the eructations are exceedingly fetid.

Nothing, however, is more common, than to have dreadful disease in these parts, with scarcely any symptoms whatever. Every practitioner must have seen extreme disease in the stomach,—great ulceration of it,—decided cancerous and other malignant diseases of this part,—without any pain worth naming;—without any vomit-

ing till just before death, and without any other symptom than perhaps extreme weakness, paleness, and some obscure uneasiness about the stomach; and perhaps not even that. It is sometimes quite extraordinary to open stomachs, and see the disease which exists there, without any symptoms having taken place, or symptoms of a very slight character. When the pylorus is affected, you occasionally have jaundice, from pressure on the hepatic duct, or on the ductus communis choledochus. Occasionally in this disease, as well as in an affection of other parts of the stomach, there is vomiting of a very fœtid secretion, and sometimes of blood; and the blood will pass through the pylorus to the intestines, so as to appear in the motions.

There is not one of the local symptoms of this complaint, that may not be absent. Sometimes there is no vomiting; sometimes there is no pain; and it is only by a very careful observation,—indeed, by considering that there are no signs of derangement of other organs, that we frequently make up our minds that the disease is probably situated in the stomach. Sometimes there is very little more than dyspepsia; and sometimes people eat well, and are but little troubled with indigestion; but, at last, there is generally more or less hectic.

These scirrhous formations and cancerous ulcerations, as well as other organic diseases, may of course exist at any part of the stomach, as well as at the two extremities; and the symptoms are generally the same. The symptoms are much less likely to be observed in the stomach, if no obstruction is produced. If an obstruction be produced in the pylorus, then you have disturbance; or if it occur in the cardia, there is great difficulty of swallowing, and great pain when the ingesta reach the part. In the case of the pylorus, the stomach becomes so distended,—from the difficulty with which the contents pass out,—that vomiting generally occurs. When there is an obstruction at the pylorus,—either from scirrhus or any other disease, though scirrhus is the most common, it is generally noticed that the stomach acquires a very large size. It becomes immense, owing to the difficulty with which the contents pass through the pylorus.

If scirrhus exist generally in the stomach, the organ becomes very thick throughout, and its cavity is diminished. The mucous membrane looks puckered and ulcerated. When the disease is situated about the pylorus, it may occasion the stomach to become of an immense size; whereas, if it exist throughout the stomach, it may produce very great contraction; for scirrhus causes a shrinking, and produces a contraction of the parts all around, which spreads throughout the stomach; and, in the case of the pylorus, produces such a contraction there, that the food will not pass through. Dr. Baillie mentions that, occasionally, there is simple stricture of the pylorus or the cardia, independently of malignant disease. These two parts are subject to stricture,—just as the urethra is,—without any organic disease whatever.

With regard to the *treatment* of this affection, it is merely palliative. You have to support the patient's strength, and to give narcotics, in order to alleviate the suffering and vomiting. There is no medicine with which I am acquainted, that produces so much alleviation in these organic diseases, as hydrocyanic acid. It frequently *arrests* the vomiting for a length of time; but it always *lessens* it very considerably. If there be very great pain, it is necessary to employ opium, in order to reduce it. I have used iodine in these cases; and, I have thought, with a certain degree of advantage. In one case of scirrhous pylorus, I exhibited iodine and prussic acid together; and the disease appeared to stop. I have no doubt that the patient laboured under scirrhous pylorus; for I felt the tumor, and the patient had a sallow look, and vomited for a length of time. I gave him these medicines as a forlorn hope, and he was much better; but, in a great number of cases, I have not seen any such result as this; and sometimes there has been no benefit whatever.

With regard to stricture of the cardia, some good may be done by mechanical means,—by passing a bougie;—taking care not to pass one so large, as to occasion suffering to the patient. In the case of a contracted rectum, benefit has been said to be derived by the passage of a bougie. Although organic disease cannot be remedied, yet the effect of it in lessening the canal may be diminished; but great care should be taken not to employ it in such a way as to cause injury.

I believe I mentioned, with regard to stricture higher up,—stricture in the œsophagus, that sometimes there is a *scirrhous*, and sometimes only a *common* stricture; and that besides these diseases which can be treated only by a common bougie, the parts are subject to spasmodic stricture. The latter case occurs particularly in females; who will sometimes, for weeks together, be unable to swallow; and then they will swallow very well. These cases are to be treated by improving the general health, by the cold-bath, and by pleasant occupation of the mind.

CALCULI IN THE STOMACH.

Calculi have sometimes been found in the stomach; but, for the most part, they have been *biliary* calculi; which have got there either by ulceration, or by passing upwards through the pylorus. One which was examined was found to be cholesterine. I shall speak hereafter of concretions of the alimentary canal at large; but you will find that some authors mention, that calculi have been discovered in the stomach, of the size of a hen's egg. I never myself saw a stone in the stomach.

HÆMATEMESIS.

There is one disease to which the stomach is very liable; and that is hæmorrhage. Without the presence of any malignant disease,—without any *organic* disease,—frequently without any inflammation that can be discovered, and frequently without any danger whatever, a quantity of blood is discharged into the stomach. It is usually dark and in large clots. When speaking of "*hæmoptysis*," or "spit-

ting of blood," I stated that one could not infer, because in these cases the blood was black, that it was venous blood; for if arterial blood be poured forth into a cavity, and lie there, it will acquire a venous character. Its nature is not to be ascertained from the colour; but when you consider that patients will pass a vast quantity of blood in this way, it is easy to conceive that it proceeds from the veins, where the motion is very slow. If it came from the arteries, one cannot but conceive that patients would suffer much more depression. We know that a great quantity of blood is sometimes discharged from the pelvis,—flows from the lower part of the alimentary canal, attended with no very great loss of strength; and there the blood is, for the most part, black.

Hæmatemesis (from *αιμα, blood*; and *εμεω, to vomit*), is usually marked by nausea and vomiting;—if not by the latter, yet by the former; and by the sensation of a load at the pit of the stomach,—at the epigastrium and left hypochondrium. Sometimes, in addition, there is great pain there on pressure. The blood, besides being thrown up by vomiting, is frequently discharged by stool. This disease occurs very frequently in persons who are dyspeptic. I do not mean to say that this affection is a symptom of dyspepsia; but those in whom it occurs are frequently dyspeptic. It is an affection that occurs far more frequently in females, than in males; and it is common in women whose catamenia are suppressed or diminished. In some persons, it will return at intervals; and occasionally it is periodical.

The ordinary form of the disease,—like a great discharge of blood from the intestines themselves,—is for the most part without danger. Persons *may* die from it; but, for the most part, they recover. Still it may be a very dangerous disease. It may proceed from an ulcer, and you may not be able to stop it; but, for the most part, it would appear that great congestion has gradually taken place in the neighbouring parts;—in the stomach, and most probably in the liver and spleen, and all around; and then this blood, half out of the circulation, is poured forth; and nature is very much relieved by it. It is, for the most part, a passive hæmorrhage. It sometimes arises from an obstruction in the liver and spleen; as well as from the want of secretion by, or discharge from, the womb. It is frequently observed in hepatic and splenic diseases. The danger chiefly depends upon the source whence the hæmorrhage proceeds. An aneurism of the aorta has sometimes opened into the stomach, and given rise to the disease. Occasionally this hæmorrhage is only a part of the affection called *purpura hæmorrhagica*; of which I formerly spoke.

I once saw a patient die from this affection, in a minute or two. I am not aware that he had hæmorrhage before; but he had some pulmonary complaint. He suddenly fell back, and died in a minute or two. Blood came from his mouth; and, on opening the stomach, it was found to be filled to the utmost with blood; which formed a large mould of the organ. I could discover no disease whatever of the part, or any vessel that let it forth. Sometimes, in this affection,

the internal surface of the stomach is pale; and sometimes it is in a state of great congestion.

With regard to the *treatment* of hæmatemesis, it may be necessary to take blood from the arm; or it may be necessary to apply leeches plentifully all over the stomach, and then to order blisters. But for the purpose of stopping the hæmorrhage, it is best to give the patient cold drinks; and, if you can, iced water. You should give him scarcely any food; and not only take care that what he drinks is aqueous, but that it is as cold as he can bear it. The oil of turpentine is one of the very best remedies you can employ. I do not know that I ever failed in stopping hæmorrhage of the stomach with it. It should be given in a small quantity;—twenty or twenty-five drops, every six, or every four hours. If it should create sickness, you will find it of advantage to unite hydrocyanic acid with it. They may be given conjointly; or you may give the acid a few minutes first. The acid has not the power of stopping the hæmorrhage; but if there be any nausea, it enables the stomach to bear the turpentine much better. I have the highest possible opinion of *lead*, in passive hæmorrhage; but here you can apply the oil of turpentine to the spot which is the seat of the affection; and although I never saw it do good in hæmorrhage from the *lungs*, yet it is superior to lead in the case of the *stomach* and *intestines*. The effect of it, when it comes in immediate contact with the part, is very great; but still it is necessary to keep the patient perfectly quiet. I have had a large number of cases of this disease, within the last twelve months; and I believe every one of them has done well. I do not remember a case, where the turpentine had not a decided effect in stopping the hæmorrhage.

The foregoing are the principal diseases of the stomach,—with the exception of dyspepsia; which is so connected with an affection of the liver and alimentary canal, that I will bring them altogether under one name,—"derangement of the digestive organs;" and will speak of them on another occasion.

ENTERITIS.

We will now pass the pylorus; and consider, first, inflammation of the intestines. In simple enteritis,—supposing it to be active and violent,—you will have acute deep-seated pain; and this may occur in various parts of the intestinal region. Although the pain is constant, yet it is aggravated at intervals; and it is increased on pressure. It differs from "a fit of the gripes," as it is called,—"pinching and purging,"—in this;—that, in common "pinching," there are intervals of ease; and when the "pinching" is over the person is comfortable; whereas, in enteritis, although the pain comes on at intervals, yet it is constant;—although it is not of uniform intensity, yet it is always present. This is an important thing to observe; for I have seen persons seized with tormina, which required brandy, or at least laudanum, to assuage it; and then, gradually, the tormina became constant; and there was pain increased on pressure; whereas, before,

it was rather relieved by it. When this change takes place, laudanum and brandy would not only be useless, but would increase the pain;—so that bleeding would be required. I recollect one case, where I was with the individual the whole time; and the series of changes was quite manifest.

In this disease, where there is this sharp fixed pain, there is usually great costiveness. The abdomen, after a time, becomes tense; and, from the severity of the pain, there is anxiety of countenance. The tongue grows white, and the breathing is quickened. Nausea and vomiting soon occur; and if complete obstruction take place, you may have vomiting of fæces. This occasionally happens; and formerly a particular name was given to it;—"the ileac passion,"—*passio ileaca*. The patient lies on his back,—just as in peritonitis; with his body drawn forwards, and his limbs drawn up. The patient lies quiet; for if he move about, he increases the pain. A patient is often disposed to be restless throughout; but, for some reason, he cannot. In these cases the patient keeps his body still; but tosses his arms about. The pulse becomes quick; and it is generally small, and sometimes hard. It is generally in cases of this kind, that we have what is termed a *wiry* pulse;—that is to say, the pulse is as small and as hard as a wire. A thready pulse is one which is as small and as soft as thread. The tongue at last grows brown; and ultimately (provided things go on from bad to worse) the pain ceases; the patient will often bear pressure; the abdomen swells, and becomes very large; and if you place your fingers across it, and strike it, the sound is as hollow as that of a drum. The patient then becomes exceedingly restless, and delirious; the pulse becomes irregular, and very rapid; the respiration is also quickened; and death ensues.

After death, you will very likely find no effusion whatever; but mere redness. Sometimes, however, you will find an effusion of lymph upon the surface, and more or less serum;—from the peritoneal coat having suffered with the rest. Owing to the great congestion, a portion of the intestines will sometimes be almost black;—as black as any blood can be. This has continually been mistaken for gangrene, as Dr. Baillie mentions; and as I stated when speaking of inflammation in general; but you find that it resists the fingers in a way that gangrene would not. You know how mere congestion will make a person black in the face. But there *may* be gangrene; though it is a very rare thing. I do not recollect having seen it. The parts become lacerable like paper, as well as black; and they smell intolerably. Occasionally pus has been found in the substance of the intestinal coats. You have the mucous membrane within, and the serous membrane without, inflamed; but the chief seat of this inflammation,—producing this obstruction and this violent pain,—I believe is the cellular coat of the intestines. I have never seen the muscular fibre in a state of inflammation. It may be in a state of *hypertrophy*; but I have never seen it *inflamed*. Acute rheumatism is, for the most part, inflammation of the aponeuroses;—even when it appears to be the muscle itself which has been affected. Rheu-

matism, generally speaking, affects parts which are not muscular; but if the muscle be affected by it, it is only secondarily. We never have an effusion into muscle, or suppuration there, or any thing of the sort. It appears to me that it is the *cellular membrane* of the intestines, that is chiefly the seat of this disease; although the peritoneal coat, and the mucous membrane, may also be inflamed.

Enteritis is distinguished from *peritonitis*, by the obstruction that is produced,—the constipation; and the consequent effects of it,—nausea and vomiting; and also by the circumstance of the pain being fixed about the umbilicus, which is generally the seat of it; whereas, in peritonitis, it is diffused. This disease is caused by anything which will produce inflammation;—cold and wet applied externally, and cold internally; and it is induced by anything which occasions obstruction. If there be a hernia, and the part becomes girt, then you have enteritis. If the fæces become black and indurated, and will not pass, then you may have this disease. Whatever causes an obstruction, is sure to produce this affection; provided it continue sufficiently long for the disease to be set up.

When you are called to a patient in this disease, before you think of anything else, you must ascertain the cause of it. You must examine every part of the abdomen, and see whether there is not an umbilical, or a ventral hernia; for patients continually have symptoms of this description, because there is a hernia; and the hernia may be so small as to escape attention. A small portion of the intestines may slip down, without the patient knowing it. Great mistakes will occur, if persons do not remember that this disease may be the result of hernia; and that a patient may have hernia without knowing it. If there be a hernia, that will be treated in the way which the surgeon thinks best; but if there be not, the first thing which you have to do, is to bleed the patient well. You should set him as upright as he can be; and bleed from a large orifice without any merey. You must of course consider the patient's strength; but you should bleed on till you make a decided impression;—till you knock down the pulse, and make him faint. After this has been done, a very large dose of calomel should be exhibited. A large dose will clear the stomach, as well as a small one; and it will be more effectual in purging. After it has been taken some time, other purgatives should be given; but immediately after it is administered, an active injection should be given; so that, if possible, they may meet half-way and combine; and then out goes the disease. You should first bleed very freely; because purgatives will not operate till you have done that. You should then give a large dose of calomel (such as a scruple) by the mouth; and then administer a strong purgative injection;—containing plenty of salts (salts and senna, if you choose), or extract of colocynth, or oil of turpentine. I would repeat the calomel in smaller doses;—say ten grains, every four or six hours;—giving purgatives, in addition, from time to time, till the mouth is sore; and in general when the mouth is sore, and the bowels are freely open, the inflammatory symptoms go away; and

as the obstruction frequently arises from mere inflammation, if you remove the latter by bleeding, and producing a mercurial affection on the patient, the former will subside.

It is also well to cover the whole abdomen with leeches. Twenty, thirty, or forty should be put upon it; and you should then give mercury till the mouth is sore, and follow it up by other purgatives;—such as croton oil, which is one of the best, and of which a drop may be given every two or three hours. Sometimes I have given a drop every hour. If these measures will not open the bowels, then you will find it of very great use to employ the smoke of tobacco. A tobacco-clyster is sometimes a dangerous thing; and you should only put a drachm to a pint of water, and throw up one-half of it, and watch its effects; but the smoke of tobacco is very manageable. There is a little apparatus for the purpose. You can feel the pulse at the same time; and regulate the smoke proportionately, at your discretion. Sydenham was very fond of this remedy; but not more so than it deserved. He says that the smoke of tobacco was, by far, the most efficacious of all the injections he knew. I know many practitioners who now employ this remedy, with very great success. If this fail, there is no impropriety in taking the patient out of bed, and throwing a few pails of cold water hard against the abdomen. That will sometimes open the bowels, when nothing else will. But where you find inflammation, and no mechanical cause that you can discover, the best mode is to treat it as an attack of inflammation; but in the most decided manner. You must take care to give purgatives as abundantly as the stomach will bear them, till they produce their effect.

This disease is called enteritis (from *εντερον, an intestine*; and "itis," —*inflammation*): because it is an inflammation of the substance of the intestines. But similar symptoms, in many respects, are produced by mere spasm;—that is to say, perfect obstruction, together with vomiting and violent pain, though pain of a different character; and then the disease is termed colic;—"enteritis," being essentially *inflammation*, but "colic" being essentially *spasm*. When the spasm ceases, however, then inflammation may come on; and you will then have a case of decided enteritis.

COLIC.

Having spoken of that description of obstruction of the bowels which is inflammatory, I now proceed to consider that which depends simply upon spasm. This obstruction of the bowels is called *colic* (from "the *colon*"). The symptoms of colic are, in the first place, constipation; with violent pain in the region of the intestines;—chiefly, as in other cases, about the umbilicus. This pain, unlike that induced by inflammation, is relieved by pressure; for there is no tenderness. The relief upon pressure is sometimes very great;—at any rate, pressure is always well borne. I have sometimes raised myself on tip-toe, and pressed on the abdomen with the whole weight of my body, and the patient has not complained at all; but, on the

contrary, has felt relieved by it. The pain is, of course, intermittent. It is not uniform; nor, indeed, is it constant. It will cease from time to time; the person will be perfectly easy; and then it comes again most terribly. In most cases there is vomiting; at any rate, there is nausea. The vomiting may be fæcal;—the fæces have been discharged upwards, as in cases of inflammatory constipation. In both cases, however, this circumstance is comparatively rare. The spasms, in these cases, are not confined to the intestines; for you will frequently see them in the abdominal muscles; so that they shall be drawn into large lumps. The recti muscles become particularly contracted; and you will sometimes observe retraction of the navel. Sometimes there is tenesmus; and sometimes there is great contraction of the sphincter ani. There is likewise violent pain felt in the loins; there is a high degree of flatulence; and there is no feverishness. It is carefully to be remembered that this state of things, however purely spasmodic it may be, will frequently, if not relieved, run by degrees into enteritis; so that, at last, you will have decided inflammation of the intestines.

The causes of this disease are, in the first place, the application of cold when the body is over-heated. This is a very common cause. Ingesta of various kinds, which disagree with the stomach, will give rise to it. Sometimes I have seen it occur from a person taking bad cyder; but in other cases it will take place, not from anything injurious in itself, but from an individual having an idiosyncrasy with regard to it. Obstruction from any cause will produce it. If there be a hernia, colic may be induced, in the first instance, before inflammation comes on. Hardened fæces is another cause of the disease. It is a common occurrence from any of those causes which, after a time, produce enteritis. Sometimes you will have enteritis first and then colic, and *vice versâ*; though the cause of both one and the other may be the same. A very frequent cause of it is a particular substance; namely, lead. In some persons, a very minute portion of it will induce this affection. A medical man told me that he had it, from a child's cot, newly painted, being placed in his bedroom. You see the affection, every day, in painters; and in persons employed in the manufacture of white lead. Individuals exposed to lead, in any way, are very subject to this disease.

After death, you may find nothing at all. Whether the disease has arisen from cold, from acrid ingesta, or from lead, you may find no morbid appearances whatever; but, on the other hand, you sometimes do. This is all a matter of chance. Sometimes the intestines are in a state of great contraction. Sometimes they are more or less inflamed; because the disease has terminated in that way. Sometimes you find the cause to have been something sticking in the way, or mechanical pressure of some kind; or you may find intus-susception,—one part of the intestine running into another. With regard to the appearance of the muscles, they are emaciated, thin, white, and pale. I have seen the muscles so flabby and wasted, that you could scarcely recognize their natural appearance. They have be-

come little more than tendons. When intus-susception has been the cause, you generally find that the upper part of the tract has passed into the lower. Dr. Baillie has given some good representations of intus-susception.

Colic may generally be treated, very successfully, by the exhibition of purgatives in strong doses. If the individual be stout, and the pulse will bear it, it is a good practice to bleed him. Bleeding, within certain limits, is an excellent anti-spasmodic;—spasms of various parts of the body will very frequently cease, on taking away blood. It is not always necessary in this affection; but it may be successfully had recourse to, if the pulse will *justify* it, even though it may not *indicate* it; and it may also act beneficially in preventing inflammation. It is very useful to give a large dose of calomel;—to administer a scruple repeatedly, after longer or shorter intervals; and after you see that it will remain on the stomach, then it is right to give some other purgative;—a strong dose of castor or croton oil, or sulphate of magnesia. One of the best purgatives is undoubtedly croton oil; and, if you choose, you may begin with it; but it will be of little use to give less than a drop. In severe cases, I would repeat it every hour or two, till it answered the purpose. Last summer I was called to a case, where the hot-bath, and every medicine in common practice, had been used, except croton oil; and even of that a dose or two had been given. But the case was very severe, and it was necessary to overcome the disease speedily; and therefore I ordered a drop every hour, or half hour, till it should operate. After about six doses, the bowels were freely opened; and the patient became perfectly well. An injection of oil of turpentine will also be found exceedingly serviceable. About three ounces, diffused in a pint of fluid, and forced into the intestines, is of great service. The warm-bath will afford great relief; but it is rather of use as a soothing measure, than anything else. The great point is to give good purgatives, and croton oil is certainly one of the best; but you may precede it, by way of laying a foundation for its action, by a large dose of calomel. At the same time, whatever good may be done, you should not omit clysters; and I think you will find the oil of turpentine one of the best. Some persons always combine opium with the calomel; and the opium may frequently do good by alleviating the spasm. This is a case in which opium may act as a purgative. By relaxing the spasm, it may cause the bowels to open; and it is thought that it very much reduces the pain, and makes purgatives and calomel stay better on the stomach. It is therefore said, that we ought always to give a larger or a smaller dose of calomel (a scruple or five grains, whichever you may have a fancy for) united with opium, and repeat it at certain intervals; but I have found the bowels open, just as well, without opium; and then there is no trouble afterwards. If you exhibit opium, after a time the bowels are disposed to become torpid; and I am quite sure that you will succeed as well without it, as with it.

When every thing has failed, I have known this affection of the

bowels overcome, by taking the patient out of bed, and dashing two or three pails of cold water upon the abdomen. In the particular case to which I have just alluded,—in which the patient had taken calomel till his mouth was sore,—before we began with the croton-oil, as the object was to open the bowels immediately, he was taken out of bed, and soused with cold water; and he was nothing the worse for it. He caught no cold; but it did not open his bowels. Sometimes it will effect that object immediately;—just as it will relieve spasmodic stricture. If all other things fail, it should be had recourse to. You will also find the smoke of tobacco exceedingly useful in this affection. It should be used as I have before mentioned. Some have even found the inflation of common air serviceable, by producing a great distention of the intestines. You will find a case of this kind recorded in the "Glasgow Medical Journal," of last year, [1831]. It is well also, on another account, to administer a clyster; for sometimes the symptoms arise from hardened fæces lodged in the rectum. I have known instances of that description; and as you do not always know whether such an occurrence has taken place, I would invariably, on that account alone, recommend a clyster. Occasionally, it is discovered,—especially in women,—that there is a mass of large hardened fæces there; and nothing will relieve the patient, but taking the handle of a spoon, and picking them out. Practitioners are sometimes obliged to condescend to this; and thus to clean out the rectum.

Supposing, however, that the disease has arisen from lead, you will find it has a great tendency to return. There is this tendency in all circumstances, but particularly in the case of lead; so that after you have once opened the bowels, it is necessary every day, for some time, to ascertain that the bowels are still regularly opened. Some German writers, and Dr. Percival, of Manchester, have praised alum very much. They state, that from two grains to a scruple has been given every six hours, with great relief. However, I should never think of depending upon such a remedy, in cases of colic. It may be very well after the attack is over, for the purpose of keeping the bowels open; but I should not think of placing any reliance on it during the fit. I know that it has been useful; for I recollect, perfectly well, having been consulted by a gentleman who, every six weeks or two months, had a violent fit of colic; so that it was necessary to put him in the hot-bath, and to exhibit a violent dose of purgatives. This always cured him, but left him in a state of great debility; and nothing that was done prevented the recurrence of the attacks. I gave him, three times a day, a scruple, or half a drachm of alum, mixed with ipecacuanha-powder; and it entirely cured him. He took it for a month or six weeks. I saw him, at intervals, for three or four years afterwards; and he had never had another attack. I dare say that ordinary purgatives, in the case of most people, will do very well; but I tried alum, in this instance, with great success. You will find it useful, where there is a tendency to disease of the intestines, to put the patient on his guard with respect to cold; and

to order him to wear flannel about the abdomen. A large roller, wound three or four times round the body, is exceedingly serviceable. This protects the abdomen against cold, and is always useful. In this, as in most other bowel-complaints, it is particularly necessary that the patient should avoid cold feet; for some individuals, if they allow their feet to become cold, always have an attack of colic. When the disease has arisen from lead, you will sometimes see the stomach remain in a state of spasm; so that there will be an aching pain there, and occasional vomiting;—notwithstanding that the bowels are regularly opened. This is a state which is best relieved by prussic acid or stramonium.

PARALYSIS FROM LEAD.

When colic has been induced by lead, you will sometimes find that, after the colic is over, the wrist will drop. The muscles situated in the forearm, and belonging to the hand, become paralyzed; so that the patient has very little use of the hand,—perhaps none; and the muscles will, at last, waste away. It is said, by some writers, that the "abductor pollicis" wastes more than the other muscles; but I am not aware that it does. Sometimes this will occur from lead, without any colic at all; but generally there is colic; and this is followed by paralysis of the wrists.

This is a state that may easily be remedied. In the first place, you should withdraw the person from the poison, and should prevent him, for a time, from following his occupation. If he be a painter, you should withdraw him from the lead, or the lead from him. It is also of great importance that he should not wear the clothes which he uses in business. A quantity of lead is still remaining upon them; and that may, of course, keep up the disease. I have no doubt that many painters might avoid the complaint, if they were more cleanly;—if they wore sleeves over their coat; and, as soon as they had done work, regularly put off their working clothes. You cannot, however, persuade men to do this. They will not give themselves the trouble, till they have once suffered for their negligence; and even then, as soon as they recover, they become careless. If painters would adopt the precautions I have given, no doubt many of them would escape.

In the way of local application, electricity is one of the best remedies. It should be applied not only to the hand, but to the forearm; because the muscles in both parts are paralyzed. I think I have seen sparks answer better than shocks; and the electricity should be applied, if possible, every day. It has also been recommended that the patient's hand should be supported by splints; and that these should be used night and day, so as to keep the hands in a state of constant extension. You will find this recommended by Dr. Pemberton. Blisters are also said to be useful. I have found stimulating applications, of all kinds, serviceable; but particularly electricity. When you apply stimulating applications to the skin, they only act on *internal* parts by sympathy. Friction may make the parts

worse; but electricity will go to every spot which is really the seat of the disease. As to internal medicines, I have never seen them do good, except it has been stramonium, or strychnine, or (which is the same thing) nux vomica. This is a species of paralysis, in which I have exhibited strychnine with decided advantage.

INTUS-SUSCEPTION.

Intus-susception,—the affection of which I spoke as sometimes giving rise to colic,—generally occurs in the *small* intestines; or else the small intestines slip down into the large,—into the colon. However, intus-susception of the *large* intestines has been seen; for the cæcum and a part of the colon have been found in the sigmoid flexure. Cases have been seen, in which the small intestines (beginning with the duodenum) have all slipped into the large intestines, and the cæcum has protruded from the anus. These are rare cases; but not impossible because they are rare.

This disease may occur from any irritation whatever; and it has sometimes, no doubt, been temporary; and has passed away. On opening animals, you will sometimes see intus-susception take place before your eyes; and then the parts will slip out again. However, when intus-susception has occurred, the parts may remain in the situation into which they have been forced; and at last cohesion takes place between the descending portion, and that into which it has slipped; and the mucous membranes may then cohere; so that complete obstruction takes place, and the person dies. Sometimes the part which has slipped in, has only adhered at the upper portion; sloughing has then taken place; and a part of the intestine has been discharged. You will be surprised at the quantity of intestine which, beyond all doubt, has been expelled in some of these cases, and yet the patient has done well. Dr. Baillie mentions having seen, or known, a yard of the colon discharged from a woman before death: she died, but a yard of the colon was first passed. He mentions another person, who lived two years after losing six inches of her colon. You may easily see how this happens, without any great mischief taking place. Adhesion takes place at the upper portion of that which has slipped down; sloughing afterwards occurs; but the part remains continuous as before,—only shorter. Whether the person has more frequent evacuations after the intestines have been shortened, I do not know; but it is an undoubted fact, that a large portion has been expelled; and yet the person has done perfectly well. You will find another case, in which twenty-three inches of the colon were discharged; and in another, twenty-eight inches of the small intestines; and yet recovery took place. Cruveilhier mentions a case, in which eighteen inches, together with the mysentery, were discharged; but the person entirely recovered, after having exhibited signs of strangulated hernia.

There is no proof of the existence of this condition during life. You cannot tell, in a case of colic, that the patient has intus-susception. I recollect being called to a case of violent colic, which ap-

peared to arise from a man drinking sour cyder, and rum, and a number of other things;—having, in a thirsty fit, drunk every thing he could reach. Violent colic suddenly took place; and his bowels, from that moment, were confined. He had castor-oil, croton-oil, olive-oil, hot baths, cold baths, and every thing that could be devised; but no evacuation was produced. He survived a fortnight; and at the post-mortem examination, intus-susception was found. Portions of the intestines were perfectly coherent together;—forming a solid mass; so that there was no continuation between the upper portion of the intestines and the lower; but the circumstance was not known before death. There was no particular tumor to be discovered. From what I have read, and occasionally seen in dead bodies, I do not think that, in a great number of cases, there can be any sign whatever. The disease has occasionally been suspected, however; and, indeed, I suspected it in the case to which I have just referred. Some persons say, that we ought to cut down upon the part;—that we are not bound to wait for the person's dying. Now the case ought to be very clear indeed, before a man's abdomen should be opened, and an attempt made to untwist his intestines directly. It has been proposed by some to cut down upon the part, wherever the seat of the pain is; but this is a very fallacious guide. You will sometimes have pain at *one* part of the abdomen; and, after death, the obstruction is found to be at *another*. But if, after symptoms of colic, a tumor be produced, the surgeon might then take into consideration whether he would cut down or not.

It may appear wonderful that so large a portion of intestine should be discharged; but the occurrence is not only mentioned by Dr. Baillie,—who, I suppose, was a man who never told an untruth in his life,—but you will find that Andral cites a case, where thirty inches of the ileum were discharged, and death did not take place for three months; and then it arose from peritonitis. He suspected that death took place in consequence of the cicatrix being lacerated by an accidental circumstance; and that, but for that occurrence, the individual would have done well. In the ninth volume of the "Edinburgh Medical and Surgical Journal," a surgeon mentions a case where the colon, the cæcum, and the meso-colon, were all discharged; but, of course, death took place.

DYSENTERY.

I now proceed to the consideration of another disease, in which there is spasm and inflammation together; and in which there is both obstruction and purging. This disease is called *dysentery* (from δυς, *with difficulty*; and εντερον, *an intestine*).

The symptoms of this complaint, are a mixture of those of colic and enteritis; so that you have violent pains of the abdomen, called *tormina*. You have also a forcing down backwards,—a forcing of the rectum, which is called *tenesmus* (from τεινω, *to bind together*); and frequently small mucous or bloody stools, together with more or less retention of the fæces; so that there is an obstruction to the course

of the fæces, but a great discharge of secretion from the inner surface of the intestines. The stools are scanty and irregular. The discharges are very frequent, but each particular discharge itself is scanty; and when the fæces do come away at all, they are found in hard lumps. Sydenham defines dysentery to be,—"frequent mucous stools, with griping." Dr. Akenside, the poet, wrote on this disease;* and he gives the same definition as Sydenham; but he adds to it—"frequent desire;"—in fact, *tenesmus*. The blood which is discharged in this affection, may be either in clots, or merely in streaks; and sometimes it is discharged in very considerable quantity, and quite liquid. Very frequently there are shreds of fibrin expelled; and Sir John Pringle says, that he has seen fatty matters discharged. That I can believe; for I could mention the same with respect to diarrhœa.

This disease may be either acute or chronic. In the *acute* affection, there is violent inflammation as well as spasm; so that there is considerable feverishness, quickness of pulse, heat, thirst, pain in the abdomen,—not only coming on in fits, like tenesmus (griping), but pain that is constant, and increased on pressure; together with dryness of the skin. This state may go off in a few days, or it may last for a month; after which time, perhaps, you may call it *chronic* dysentery. The liver very frequently ceases to secrete, so that no bile at all passes away; and sometimes it is in a state of great irritation; so that it secretes *green* bile, and the *motions* are therefore green. Sometimes, however, the motions appear to be of a pitch-like substance. Sometimes, instead of thick mucus, there is thin serum; and from there being a little hæmorrhage, this serum is rather red; so that the discharge from the alimentary canal has, very aptly, been compared to the washings of meat. The discharge may be of all colours, and of all qualities; but the fæces are usually retained. If you procure an evacuation of fæces, they come away in hard lumps; which are called *scybala*, and are like forced-meat balls, only hard. Nature gets rid of these balls from time to time. The tongue is foul; and very frequently aphthæ appear;—from the mucous membrane suffering.

This disease is very common in hot climates; and most common in this country, in hot weather. It is frequently united with the fevers of hot countries, and of our hot seasons; and frequently it is conjoined with intermittent and remittent fevers. Sometimes it precedes, and sometimes it follows these. Sir John Pringle and Sir Gilbert Blane both say, that it arises in camps at the same seasons, and under the same circumstances, as bilious fevers. It has now and then, curiously enough, been observed to be vicarious with fever. It will cease in the army and navy, in different parts of the globe, when fevers begin; and will re-appear when they cease; but, very frequently, it is united with them. It has been known to co-exist with typhus fever; and likewise to alternate with it. When typhus fever

* "De Dysenteriâ Commentarius. London, 1764."

prevailed lately in Ireland, dysentery prevailed at the same time, and occasionally alternated with it. It is very common for it to occur with disease of the liver; and occasionally it has been united with measles. The causes of hepatic disease, and the causes of fever, affect all parts of the abdomen.

The *chronic* form of the disease, is much less violent than the *acute*; and is attended with much less pyrexia. Indeed, the pyrexia, in the chronic form, may at last become hectic. The intestines become diseased; suppuration and ulceration occur; and you have hectic fever. Sometimes, in the chronic form, there is no fever at all, for it degenerates into diarrhœa; so that all the patient complains of, at last, is mucous stools and tenesmus. The fæces not being retained, it may degenerate into diarrhœa; so that you have dysenteric diarrhœa;—that is, diarrhœa characterized by great griping, and a discharge of mucus. It has been observed, in hot countries, that more stools take place at night, than during the day; and at new and full moons, than at other times. I mentioned, when speaking of remittent fever, that there is no doubt whatever that, at new and full moon, that fever prevails most, and the symptoms are more intense than at other periods. The same has been observed with regard to dysentery. More stools take place at that time;—not from the direct influence of the moon; but, from the high tides that then take place, there is more vegetable decomposition.

After death from the *acute* form of the disease, we see great inflammation of the intestines,—chiefly of the large ones, and particularly of the colon. This disease so particularly affects this part, that some have proposed to call it *colitis*,—"inflammation of the *colon*;" but that would not be quite correct; for it also affects the rectum, and likewise the small intestines. The great seat of the disease, however, is the colon and the rectum. Besides marks of redness and congestion, there is occasionally superficial abrasion of the mucous membrane; and sometimes deep-seated ulceration, and great distension. After the *chronic* form of the disease in the same situations,—namely, the colon and the rectum,—we find great redness and ulceration; but we also find that effect so peculiar to chronic inflammation,—great hypertrophy;—such thickness as acute inflammation will not induce. There is great thickness of all the coats. The rugæ are all greatly enlarged; so that the inner surface is exceedingly rugged, and you see shreds of lymph (sometimes of great length) hanging upon it. Occasionally these changes are seen only in patches; and occasionally they are seen over a very great extent; and, at the same time, red patches are frequently seen in the small intestines. The colon has been found, after this chronic form of the disease, as much as a quarter of an inch in thickness. Minute abscesses, too, are seen in the substance of the intestines. On opening the glands, you find them so very much enlarged,—so much hypertrophied, as to look like so many warts. Besides the morbid appearances just mentioned, it is not uncommon to find the *liver* in a state of disease. It is frequently in a state of chronic inflammation; and, occasionally, in a

state of abscess. The *spleen*, sometimes, is in the same predicament. The liver, however, is much more frequently affected than the spleen.

As to the *causes* of dysentery, all agree that it is very often produced by changes from heat to cold, and from cold to heat. The tendency to it is greatly increased by long-continued heat, and by fatigue; therefore in those countries where it is continually seen, it frequently breaks out when the army has suffered to a great degree, or there has been a sudden vicissitude of temperature. A cold wet night, after an intensely hot day, will occasionally produce this affection, in a vast number of persons. It is a disease particularly common on board ships, and in camps. Some consider that one cause of it is malaria; and certainly it is a fact that, where malaria prevails to a great extent, dysentery is very common; but as these are wet situations, one hardly knows whether it is the malaria itself which gives rise to it. You will recollect I mentioned that, with the remittent fevers of hot countries, there are bilious fevers of all kinds. It is also undoubtedly produced, sometimes, by bad food; and likewise by bad water. This disease, for example, prevailed in the Penitentiary at Milbank; where there is a combination of unfavourable circumstances. The prison itself is situated in the most unwholesome place imaginable;—as if it were intended to carry off quickly the people who have been placed there; and I believe the allowance of food was not such as medical men considered to be proper. It co-existed there with scurvy, and various other diseases. Formerly dysentery was very common in London; but at present we seldom see it. I scarcely ever meet with a case, except in those who have been in hot climates; whereas, formerly, it was one of the greatest scourges in the metropolis. You find it treated of by Sydenham, as one of the diseases that came daily under his observation. It was one of the great causes of mortality in the city;—just as was the case with ague, plague, and scurvy. I presume it arose, then, from the bad quality of the food upon which people lived, and the bad drainage of the city. As to the ill effect of bad water, it is said that when the disease prevails in ships, those suffer most who are nearest the pump.

It has been supposed that fruit produces the disease; but unless the fruit be bad, there is no reason to suppose that this is the case. Of course bad fruit, coming under the head of bad *food*, might produce it; but the mere circumstance of eating fruit at the time when nature provides it for us, does not give rise to the disease. On the contrary, there are on record many cases of fruit having proved exceedingly beneficial. You will find it mentioned by Zimmerman, in his work on Experience, that in 1751, a whole regiment, in the south of France, was nearly destroyed by dysentery. The officers purchased the entire crop of several acres of vineyard for the regiment; and not one man died from that time, nor was one more attacked. The work is well worth reading; for it is as amusing as a novel, and full of instruction. Tissot, a French writer, also mentions that eleven

persons in one house were attacked with dysentery. Nine of them eat fruit and recovered; but the grandmother, and one darling little grandchild, had wine and spices instead,—as being more comfortable; and both died. It was observed in Holland, that the worst flux which was ever known in the army, occurred at the end of July, when there is no fruit there but strawberries, of which the men never partook; and that the disease ceased entirely when October arrived, and brought the grapes, of which the men eat very heartily.

Any cause of intestinal irritation may produce dysentery; more particularly when a predisposition has been given by long-continued heat, and by bad food; under which term, of course, *drink* is included. It is said that, at the old barracks at Cork, the troops had water contaminated by the common sewers, and made brackish by the tide; and dysentery prevailed. This was remedied; and the disease almost entirely ceased. Linneus's friend, Rolander, had dysentery from drinking standing water out of a cistern of juniper wood. He ascribed the disease to animalculæ; but the mere circumstance of its being stagnated water, was sufficient to account for the disease, without calling in the aid of animalculæ.

It was formerly supposed that this disease was decidedly contagious, and that it spread most from the stools; so that if any individual followed another labouring under dysentery, for the purposes of relieving nature, it was conceived that he was more liable to catch it, than by simply being with him. Whether it is contagious or not, it is impossible for me to say; but the sporadic cases of chronic dysentery, which we occasionally meet with in those who have come from hot climates, certainly are not contagious. I never saw any thing that could lead to the supposition of the disease being so. I will not presume to deny that sometimes it may be contagious abroad; but many diseases are supposed to be contagious that are not. I think it may reasonably be doubted, whether it is contagious. Some imagine that almost any particular disease, in particular circumstances, may become contagious; and therefore I do not say that it *never* is contagious; but as the disease is seen in England, it certainly is not.

I mentioned that this was a disease which prevailed particularly in camps, and in the fleets abroad. In the Peninsular war, our army lost no fewer than four thousand seven hundred and seventeen men by this disease exclusively. In 1812, two thousand three hundred and forty died; in 1813, one thousand six hundred and twenty-nine; and in 1814, seven hundred and forty-eight. The disease is very manageable, if taken in the first instance; but extreme mortality arises from the unfavourable circumstances in which men are placed. From the want of all comfort, and the excessive fatigue, medical men have little chance of doing good.

With regard to the *nature* of the disease, it appears to be inflammation of the mucous membrane, together with spasm of the muscular fibres, *chiefly* affecting the large intestines. One ought not to say "*altogether* affecting the large intestines;" but it affects them

much more frequently than it does the *small* intestines. The inflammation gives rise to constant pain, to sickness, to pyrexia, and to a great dicharge of mucus and blood. The spasm gives rise to occasional severe pain; and to the retention of the fæces. As to the *prognosis* of the disease, that must depend upon the violence of the symptoms; but you will always find it mentioned by authors, that one of the worst symptoms that can occur, is the discharge of worms;—as though the worms instinctively knew that the habitation was about to be dissolved; and that therefore the sooner they quitted it the better;—just as rats are said to quit an old barn, and to look out for a new habitation, before they are turned loose by the destruction of the present.

With regard to the *cure* of the affection, the first thing is, to remove, if possible, the cause of the disease. If there be a bad quality of the ingesta (whether liquid or solid), or any dampness in the situation, or any contamination of the atmosphere, all this should be obviated;—either by removing the patient from it, or by removing it from the patient; otherwise you are fighting against a double enemy;—both the disease and its cause. In *acute* dysentery, we have to treat the affection upon a decidedly antiphlogistic plan. It may be necessary to bleed vigorously in the arm; to apply leeches freely and repeatedly to the abdomen; to give mercury, and get the mouth sore; to apply cataplasms of hot moist bran to the abdomen; or, if it be preferable, to apply them cold; but, in general, the moisture answers much better if it be warm. You must treat it as a violent active inflammation of the intestines. With regard to calomel, you will find that, although all agree upon its importance in this disease, yet that some recommend *large* doses at intervals, and others *small* ones. Those who recommend the latter, would give other purgatives, such as castor-oil, at intervals, for the purpose of emptying the intestines; whereas, those that give large doses, trust more to the calomel itself. It is highly necessary, in this disease, to open the bowels well. Notwithstanding the number of evacuations, the fæces are altogether or greatly retained; and therefore it is necessary, not merely to employ the remedies for inflammation, but to empty the intestines thoroughly. Some people would give a scruple of calomel at intervals;—so as to get the mouth sore as quickly as possible, and at the same time to empty the alimentary canal. Those who give small doses, would give other purgatives in great abundance; but it is necessary to get the bowels open, as speedily and as effectually as possible. It is useful to employ opium at the same time;—on account of the great tendency which there is to severe spasmodic pain. The opium may be united with the calomel; and if you take care to make the calomel operate by means of other purgatives, no harm can arise from it. If castor-oil will stay on the stomach, I should prefer that medicine to salts; because there is, perhaps, a great discharge of mucus; and perhaps there are watery stools rather than fæces; and castor-oil has the property of thoroughly emptying the alimentary canal. Emollient clysters are also

of the very highest importance; but nothing acrid should be put into them. Clysters of gruel, containing a certain portion of laudanum and castor oil, will be much better than clysters containing salts. The patient should be kept without food;—his stomach should be allowed as much repose as possible;—he should be kept exceedingly low.

Many persons, formerly at least, had a very high opinion of ipecacuanha in this disease. Dr. Akenside, the poet, in his elegant Latin treatise on this disease, recommends about three or five grains of ipecacuanha every six hours; and many persons still give it, and also antimony, so as to create sickness. I myself have no experience of any such plan. I do not see the utility of causing the patient to vomit in this disease; neither have I ever myself been able to discover the soothing effects of ipecacuanha. Some persons, when they give purgatives, give ipecacuanha; and say that it has the property of emptying the alimentary canal; but after repeated trials, I cannot say that I have found that it has any peculiar properties, except that it makes the patient sick. I have been as successful in this disease as in any other, by treating it on antiphlogistic principles;—without exhibiting any thing with the view of producing sickness, or any specific operation. Formerly, various preparations of antimony were given; but I have really not found them at all necessary.

With regard to the *chronic* form of the disease, you are to consider whether there is any inflammation still existing. There very frequently is. The abdomen is still tender; and it would be absurd to think of giving astringents, and blocking up the intestines, while that inflammation exists. You will find that the readiest way of lessening the disease is, in the first instance, to apply leeches freely over the abdomen, and to throw up a clyster;—taking care that the bowels shall be opened freely and regularly; and when you have done all this, then astringents will be very proper.

In chronic dysentery there frequently is no inflammation at all. The time arrives when there is a mere gleet of the surface, or the surface is merely in a state of irritation; and in that condition, opium and astringents of all kinds are exceedingly serviceable. But you may do infinite mischief unless you ascertain, before you give astringents, that there is no inflammation. If there be inflammation, you must treat it accordingly;—by leeches, blisters, fomentations, and things of that description; and you must take care to see that the bowels are regularly opened, and the fæces discharged; because if the fæces are not discharged, and you exhibit astringents, you will produce inflammation, though there was none at first. But in the chronic form of the disease, the fæces, at last, are discharged pretty well; and no purgatives are required. Still, however, the character of the acute disease so far remains, that there are bloody and mucous stools, a desire to go to stool, and tenesmus. In this form of the disease, astringents may be given safely, and may be either vegetable or mineral; and it is best to combine them with opium. By far the best astringents that I know, are kino and catechu. It may be right

not to give the tinctures, as they may excite the pulse, and irritate the patient. It is best to give the infusions. Opium is very much required in this disease, to prevent griping. As I before said, opium is often very safe and very useful in the *acute* form of the disease;—provided you take care to subdue inflammation, and to keep the bowels open; but in the *chronic* form, it may be given with very great safety;—provided the bowels be regularly open,—as is usually the case. A good mode of exhibiting the opium, is to give the Pulvis Catechu Compositus. It will not irritate so much as opium alone will do.

You will find that when the ordinary astringents (catechu and kino) fail, mineral astringents will frequently cure the disease; and that which I have been most in the habit of employing, and with very great success, is the sulphate of copper. The way in which I became acquainted with its use, was from hearing a gentleman state that, at the Medical Society, at Guy's Hospital, a case had been read of violent chronic diarrhœa; which yielded to nothing but copper. Dr. Sutton, of Greenwich, at a consultation the other day, informed me that he had a very obstinate case; and that all the other astringents having failed, it occurred to him to try this; and he did so with very great success. I have consequently used it; and it certainly is one of the best, where mineral astringents are required; but it is necessary to remember that you should not give it on an empty stomach; because, if it come in contact with the organ, it will excite vomiting. It should not be given till after breakfast; and that is the case with most acrid substances. It stands to reason that, if they be not given till the patient has had a meal, they will produce less irritation of the stomach, than if they come in direct contact with it;—which they must do when the stomach is empty. It is right to give this medicine in the form of a pill; because all acrid substances act more powerfully in a state of solution. If it be given in a pill, it comes in contact with a smaller surface; and will therefore produce less irritation than if it were diffused. It is generally right, also, to give it with opium; because, although it is an astringent, yet it is an acrid substance. It has two properties;—the one astringent, the other acrimonious; and therefore it is best united with opium; but I have frequently omitted the latter, and continued the former, with perfect safety. The smallest dose which it is worth while to exhibit, is a quarter of a grain; and you may gradually increase this to three grains. You may consider this the largest dose that patients will ordinarily bear. In fact, many will not bear more than a grain and a half. It produces no constitutional effect. I have known a patient take it for three years, for a peculiar kind of diarrhœa, without any such result. I never saw such a constitutional effect arise from it, as occurs from lead or arsenic, or any other mineral substance. If it produce sickness, you will find it of great use to give hydrocyanic acid with it. If you give from one to four drops of the acid, according to the necessity of the case, when the copper is taken, you will find that patients will bear it without

sickness and without nausea; though without it, perhaps, there would be both. By a steady perseverance with this medicine, or with vegetable astringents and opium,—taking care, at the same time, to have the abdomen well covered with flannel; making the patient avoid cold, and every kind of ingesta likely to irritate the alimentary canal; and, at the same time, supporting his strength,—you will effect a cure in the greater number of cases. It is a rare thing for me to lose a case of dysentery. I do not know how long it is since I lost one; but certainly it is not a very common complaint.

In the chronic form, if the intestines be ulcerated, you may still cure the disease; for it is only when there is a very great degree of ulceration, that patients die from it. Ulceration of the intestines will heal,—just like ulceration of any other part; but of course you will meet with cases, where medicine can do no good;—where the intestines are in a state of hypertrophy,—look as if they were worm-eaten;—where the mesenteric glands are diseased; and frequently perforation takes place, and the patient is destroyed by peritonitis. A representation of such a case as this, is presented in Dr. Baillie's plates; and nothing can be expected to do any good in it. A surgeon would not be expected to cure a leg or an arm, in such a state as that. If the patient may sink from the disease of a part so unessential to life as an extremity, much more may he do so in the case of the intestines. Some persons recommend other substances in this affection;—such as nitric acid and muriatic acid, united with opium and astringents. You would expect, *à priori*, that such medicines would only cause irritation; but there is testimony in favour of muriatic acid combined with opium; and some say the same of nitrous acid. I have never given acids in the disease. I have known them, when taken in other diseases, produce a pinching in the bowels; and therefore I have never ventured to give them to a patient labouring under this affection.

You will find it very necessary to alleviate one symptom; and that is the tenesmus. If there be any tenderness about the abdomen at large, leeches should be applied to the anus, as well as to the front of the abdomen; because tenesmus may arise from an inflammatory state. When, however, it does not arise from an inflammatory state, but rather from irritation than anything else, opium is very useful. It is best to give it in the form of tincture, in a very small quantity of fluid. About four ounces of fluid is the utmost that can be given; because you wish it to be retained, and not to be rejected. Bulk will irritate as well as acrimony; and, therefore, when you are giving it to lessen the pain and tenesmus, as small a quantity as possible should be employed. About forty or fifty drops of laudanum, given in a little starch, will be one of the best injections of the kind. Sir James M'Gregor says that, in the Peninsula, he found great relief from injections of acetate of lead; so that we might put laudanum into a solution of the acetate of lead. I presume one or two grains of the latter would be enough. We know that lead has a soothing

effect on a raw surface, or on a mucous surface in general; and therefore we can conceive that this would be a proper medicine.

As to mercury, I have never given it in the chronic form of the disease. I have always been able to cure the affection, as we see it in this country, without it; and Sir James M'Gregor says that, in the Peninsula, it was worse than useless;—it was absolutely injurious, unless the liver was diseased at the same time. I have repeatedly watched the motions in this disease. In scores and scores of cases, they were quite white; and white for a month or two;—more like paste than anything else; and, without giving any mercury, I have suddenly seen bile in them. The intestines are restored to their function; the health is improved; the liver begins to do its duty properly; and, without exhibiting mercury, you will see the bile return,—sometimes gradually, and sometimes suddenly. When you consider that mercury renders the body more susceptible of cold, and that your object is to soothe the patient, I would not recommend it to be given in the chronic form of the disease. I believe I mentioned the necessity, in the chronic form of the disease, of well bandaging the patient's abdomen; and some persons, instead of employing flannel, prefer straps of adhesive plaster all over the loins. This might be applied first, and bandages over it.

DIARRHŒA.

I now proceed to the consideration of that disease into which chronic dysentery degenerates; but which happens every day (indeed I may say every hour) without dysentery;—namely, *diarrhœa*. By "diarrhœa" (from διαρρεω, *to flow through*), is meant frequent liquid, and rather copious, feculent stools;—not dependent upon debility of the sphincter ani. In dysentery the stools are not feculent. When a person is weak in the sphincter ani, he may have stools every ten minutes; but he would not, on that account, labour under diarrhœa. In this disease there is only pain at the time of the evacuation. It is pinching enough, and pretty sharp then; but it ceases as soon as the evacuation is effected; whereas, in dysentery, the griping is horrid; and is not lessened by the discharge of mucus and blood which characterizes the disease. Cullen, in his definition, says there is no preliminary fever; and that the disease is not contagious;* but there may be preliminary fever in diarrhœa, inasmuch as it is frequently inflammatory. I should be content with the definition I have given.

The discharge, in this disease, is of all colours;—white, green, black, yellow, and clay-coloured; and of various colours at various times. It is also of all kinds of disagreeable odours;—sour, fetid, and every other variety of unpleasant smell. It may likewise be bloody, watery, mucous, or purulent. Occasionally, the motions can hardly be called *liquid*;—they are only very *soft*. Sometimes

* "Dejectio frequens; morbus non contagiosus; pyrexia nulla primaria."

they are uniform in their tenacity or softness; and sometimes they differ in different portions. It appears that the discharge is chiefly an increased secretion of the intestines, and sometimes of the liver. Sometimes the nature of the discharge is dependent upon some other organ. The discharge may be purulent from an abscess in the liver, or perhaps an abscess in the ovaria. There are all degrees of the disease, and all durations of it.

After death you will sometimes find nothing;—it has been merely an excessive secretion; and, on the other hand, you will frequently find all degrees of redness and congestion. Frequently the mucous membrane is found softened; and then it may be either red or white. Sometimes it is *inflammatory* softening, and then it is *red*; and sometimes it is without any mark of inflammation, and is quite *white*. Occasionally the mucous membrane is found very much thickened; and it is also ulcerated. Sometimes the ulceration is a mere superficial abrasion; and sometimes it is very deep;—appearing to have begun in the mucous follicles. The mucous follicles may contain (as in chronic dysentery) curdy stuff, and sometimes pus. The follicles are frequently in a state of hypertrophy; and sometimes, without being ulcerated, they contain pus. In fact, you have all the various states of the intestines which I mentioned, as being seen after fever, and in chronic dysentery. These may occur in the large intestines, or in the small intestines, or in both;—sometimes very extensively, and sometimes partially.

The *causes* of the disease are, in the first place, too much food. If a person eats a great deal, it must find its way out; and it does. There must be more *exportation* in proportion to the *importation*; so that diarrhœa is very frequently an effort of nature; and the person would be badly off if he had not diarrhœa. An alderman, I should think, would suffer severely, if he had not many attacks of diarrhœa, in the course of a season. Improper articles of food will give rise to diarrhœa. Every body knows, that if he take something which disagrees with him, he will suffer from it;—nature makes a proper effort to get rid of it. Frequently *new* articles will occasion diarrhœa. If a person eat something to which he is not accustomed, although it may be excellent in its kind, it will frequently give rise to the disease. Children suffer exceedingly, if they are weaned too early, or too suddenly. There is a particular kind of diarrhœa in infants, called *weaning-thrush*. If children be weaned before nature is ready for the change, or if that change be made too rapidly, diarrhœa takes place. Children cannot bear the sudden change from milk to common food; whereas, if they be strong, and be weaned gradually, they bear the alteration of diet very well. This is precisely analogous to what is observed with regard to fish. There are *salt*-water and *fresh*-water molluscæ; and if you put the *salt*-water molluscæ into *fresh* water, and *vice versâ*, they will die; but if you mix the water gradually, so as to lessen the saline quality of the water by degrees, they will live in it as well as if they had been always accustomed to it; and the same with regard to the *fresh*-

water molluscæ living in *salt* water. A new article of food is a common cause of diarrhœa, both in children and adults; but especially in the former.

Cold, especially after heat, is another common cause of this complaint. The mind, too, has a very great effect. Fear is generally considered to operate very strongly on the intestines. Malaria is enumerated among the causes of this disease. The suppression of other discharges will sometimes produce it. If a person have been accustomed to a running of the leg, and it is suddenly stopped, he may think himself well off if he have diarrhœa; because, if he had not, he might have apoplexy. Metastases are causes of it. If another disease cease, it is common to see diarrhœa begin. If inflammation suddenly cease, diarrhœa may occur. Dysentery is mentioned as one cause of it. This is an affection which is very commonly produced by other diseases; or it becomes a part or consequence of other diseases. In fever, for instance, diarrhœa is very common;—it becomes a part of the fever. It is very common after measles. Measles affect the intestines almost as much, I was going to say, as the skin; but, at any rate, they affect them in a very remarkable degree. So, again, in phthisis;—the same state of the body that gives rise to that affection at last, causes a great irritation of the alimentary canal.

Besides the exciting causes of the disease itself, there are exciting causes of *paroxysms*,—if I may so call them. For instance, when a person is labouring under diarrhœa, if he move about much, he will very likely be obliged to go to stool; and again, on taking food, many persons immediately have a desire for a motion. Sometimes it is *warm* food, and sometimes it is *cold*, which has this effect. Frequently persons can take nothing warm, without having a desire to go to stool; and the application of cold to the surface, will bring on the desire in a moment. The best plan is to sit quietly by the fire without moving.

As to the *treatment* of this disease, if it be slight, it is best to do nothing at all. It is generally a mere effort of nature, to relieve herself from something improper, which has been taken inwardly; or from the depressive action of an agent applied to some other part of the body. When cold has been applied to the surface, nature relieves herself in this way; and if the individual do not make it worse, he is sure to get better. But if it be necessary to adopt any measures, mild diluents, in the first instance, are the best things. Every old woman knows that barley-water, chicken-broth, and so on, help to soothe the intestines. To these some persons add mild purgatives; and some are in the habit of giving the patient a dose of physic, whenever he has diarrhœa; and, in general, there is no harm in it. If anything acrid have been taken, it may aid nature, and the disease may cease so much the sooner; but if there be merely an excessive action going on,—from a depressed circulation of the surface, or the passions of the mind,—one cannot see what good can be done by a purgative. As the disease, however, in most instances,

if left to itself, would cease without any remedy at all, a purgative has frequently the credit of curing it, when it deserves no credit at all.

If, however, the disease run on, it may be necessary to stop it; and, for this purpose, various opiates and astringents are given. It would be well, in these cases, to avoid giving tinctures; because there is frequently an inflammatory state; and an astringent is just as good *without* the alcohol, as *with* it. I need not enumerate chalk-mixture, catechu, kino, and all the various modes in which opium is given. In very severe cases, the same treatment should be adopted as in chronic dysentery;—the exhibition of sulphate of copper, and other astringents. For what I know to the contrary, you might give these astringents with safety at the beginning. I have done so; but it is too powerful an astringent to be frequently required. The sulphuric, nitric, and muriatic acids, united with opium, have been given in these cases, as well as in dysentery. Dr. Moses Griffiths, who invented a mixture of iron called "Mistura Ferri Composita," recommended in diarrhœa a mixture, consisting of two drachms and a half of tincture of rhubarb, and six drachms of linseed-oil;—a portion of which was to be given two or three times a day. I have known this administered with good effect. The rhubarb, besides being a moderate purgative, is an astringent; and the oil is a demulcent. The one soothes, the other astringes; and it is thus that it has a good effect in chronic diarrhœa. It is also given in chronic dysentery. You will find it in some of the Hospital-Pharmacopœias. It is a very disagreeable remedy;—as vile as can be well conceived: and I myself never found it necessary to give it; but it is sometimes a good medicine in this disease.

It is always necessary to ascertain carefully, whether the disease is not inflammatory. After measles, it generally is to a certain degree; and you should always press the abdomen, and see whether there is tenderness; because you may in vain give diluents, opiates, and astringents; and may even make the patient worse by them than if you did not give them at all, if there be a degree of inflammation which you do not take means to remedy. I have seen many cases of diarrhœa, which have resisted all the means that could be adopted; but which ceased presently on applying leeches to the part, or on the application of a blister. In fact, this disease is frequently nothing but an inflammation of the mucous membrane; and it will cease if you apply blisters. It is frequently necessary, while you are doing this, to give opium and astringents; and you may do so with perfect safety, if you attend to the inflammation. Indeed, if you attend to the latter, there is frequently no occasion to give the former at all; and if you do *not* attend to it, you make the patient worse by their exhibition. The first thing to be done, therefore, in cases of this disease, is to inquire into the cause. If the patient have been eating improper articles of food, you must change his diet; if there be any inflammation, you must treat it accordingly; if there be no inflammation, or not much, then you must exhibit opiates and astrin-

gents; and in this way you will cure the disease. The mildest of all astringents, is chalk-mixture and a little laudanum; but if that will not answer the purpose, you must go on to catechu, kino, and sulphate of copper;—taking care that the patient be well purged in this disease,—just as I mentioned in chronic dysentery.

This is the common form of diarrhœa. Occasionally, however, we meet with some singularities in this disease. You will recollect I mentioned that Dr. Baillie described a particular kind of jaundice,—remarkable for its being green, and for its ending unfavourably. He has also described a kind of diarrhœa, remarkable for the fæces being white, and likewise terminating for the most part fatally. You will find it described by him in the "Transactions of the College of Physicians." He says that, in this particular kind of diarrhœa, the stools are white,—like a mixture of lime and water;—that is to say, like thin mortar, or mortar spoiled. They are also frothy, of a sour smell, very copious, very numerous, and unattended with pain. The disease is so chronic, that it may last for years. It most commonly occurs, he says, in men,—not in women; and more particularly in men who have been in warm climates, and suffered from disease of the liver. He says that the affection may occasionally be suspended, and that the fæces will sometimes become brown; but the disease returns; and the motions become white again, and also fluid. The affection is very rarely removed. The patient wastes away under it, and dies.

Now this is a disease which I have occasionally seen; and though Dr. Baillie could not cure it, I have been successful by treating it in the same way as ordinary diarrhœa. I have been successful in two cases which I have had of it, by persevering steadily in the exhibition of sulphate of copper combined with opium. Without giving mercury, the motions of these persons became bilious;—they ceased to be white; and at last they became firm, as well as of a proper colour. One man was a patient in the hospital. He got stout, regained his looks, and would not stay any longer. His disease might return a year or two afterwards; but I kept him there a considerable time, and he remained perfectly well. He had been in hot climates; and, in all respects, corresponded with Dr. Baillie's observations. The other case occurred in a gentleman who had long been in India; and after persevering with medicine for nearly two years, the disease, I understand, has entirely ceased. He is an old man, and his constitution has given way to the warmth of the climate. He has had attacks first of one thing, and then of another; but his diarrhœa is perfectly cured. Dr. Baillie mentions that he has tried the ordinary remedies of kino, catechu, and chalk-mixture; but that they have all been unsatisfactory, and have all failed; but by persevering with sulphate of copper and opium, and giving tonics at the same time, my two cases did well. Sulphate of copper alone might have done.

You will occasionally see, in diarrhœa, very considerable shreds of lymph discharged. Patients tell you, that they have discharged great pieces of skin;—that they are sure the coats of their bowels

are coming off; and medical men have thought the same thing. Dr. Baillie once believed, that he saw a portion of mucous membrane come away. But he afterwards detected his error; and said that it was nothing more than an effusion of lymph, corresponding with the effusions sometimes found on a serous membrane; and exactly like those tubercular substances, which sometimes come away from the air-passages. Occasionally a large quantity of fibrin is secreted on the inner surface of the mucous membrane, in chronic dysentery; and it will come away in the form of large shreds, or even tubes. I have always seen this form of the disease marked by great pain; and have found it exceedingly obstinate. I have not seen more than three or four cases; but by the most persevering treatment, I have not done any good. I have merely afforded temporary relief.

DISCHARGE OF FATTY MATTERS.

There is another discharge from the alimentary canal, more curious than that last described, and that is a discharge of fat,—both in a liquid and a solid state. Sometimes it is discharged with diarrhœa; and sometimes without it. Occasionally the lumps come away with great pain. In other cases, it is oil that comes away,—just of the colour of melted butter. My attention has been attracted to it, from having had some cases of this description under my own care. My curiosity was excited; and I was led to read upon the subject. I find that Sauvages, whom I mentioned as having been the first framer of a system of Nosology, has mentioned a *diarrhœa adiposa*; and he says that he has known the bowels, after hard riding, pour forth adipose matter. He says that, apparently, this adipose matter had been absorbed by the blood vessels; where, being mixed with the blood, it rendered the latter viscid. It then partly flowed into the intestinal canal; and there, as it were, covered the fæces with butter. That is his description of it. I found, however, several very satisfactory cases of this disease. There is one of a woman who discharged every day, for fourteen months, a large quantity of yellow fat; which lay on the fæces, like melted butter. Sufficient was collected to fill a number of vessels; and when thrown into the fire, it burned with a bright flame. After the fæces had cooled, it concreted; and became of the consistence of absolute fat. But (what was singular) there was neither tenesmus, emaciation, nor colliquative fever; and sixteen years afterwards she was in excellent health. This case is related by Tulpius; but he says, "What is this to an old woman who, in her seventieth year, voided precisely similar fat from the intestines and bladder?" These are singular cases; but I believe them. Tulpius adds that, towards the close of the disease in the last case, the patient became feverish, and in consequence emaciated; and that death found her little else than a parched and juiceless corpse. I find another case, where a patient, for some years, had suffered pain in the stomach. Nothing relieved her, and she became worse; when she one day discharged about three pounds of fat; and

from that moment speedily recovered. I find another case, where a patient discharged from his bowels, for two years, a large quantity of fatty substance. He grew thin and weak, and then died. In the "Edinburgh Medical Essays," you will find a case described which occurred to a weaver, forty years of age; who, in attempting to take up a very heavy vessel, felt his back-bone crack; which crack was attended with violent pain. Being unable to stand, he fell to the ground. The pain long continued very severe. He fancied that the bone was dislocated inwards; and, in order to reduce it, made one of his neighbours pull his belly backwards; while another, getting on his shoulders, pressed them downwards and forwards; by which he thought his loins were made much straighter than formerly; and he had less pain. Some days after this, a country bone-setter undertook to put all the bones right;—making one man pull at his shoulders, and the other at his legs, in a contrary direction. By this extension, he was put to most exquisite torture; and all his complaints were increased. Three months afterwards, he could just manage to crawl out of doors; and then observed among his excrements a whitish substance, about the bulk of a large walnut. It was like tallow, or hardened marrow;—being composed of small globules. It melted on the application of heat. During several days after this, he observed several pieces of the same sort of substance (of the size of kidney-beans or peas) come away among his fæces. He thought all those lesser pieces, if they had been put together, would have been equal to the large piece he passed first.

I had, in St. Thomas's Hospital, a patient with diabetes, who had wasted away. For some reason or other, I happened to see his motions; and there was lying upon the fæces a large quantity of fatty matter,—soft fat; which, he said, was quite fluid when discharged. I looked at the fæces regularly every day; and there was always one or two table-spoonsful of this fatty matter. I took a part of it to Dr. Prout, and some to Mr. Faraday. It was also seen by some others of the first chemists in London; and they found it to be similar to fat. The question asked was,—"whether the patient had taken castor-oil?" But he had taken nothing of the kind,—nothing oleaginous. The fat ran away, in this liquid form, with his motions, or after them; and when he had diarrhœa, it came at the top. It was voided like oil; but presently concreted. His wife told me, that this was the first symptom of his complaint. He had formerly discharged an immense quantity of it; so that full one-half his motions were fat. What was curious,—the disease ceased while he was under my care. He died of diabetes and phthisis. I opened him; but there was nothing particular to be found. The diabetes had arisen from organic disease of the kidneys; but there was nothing else to be found there. The intestines looked greasy enough;—they were like paper steeped in oil; but that was all. No oil was found in the alimentary canal. Dr. Prout tells me that, in cases of this kind which have come to his knowledge, there was considerable disease of the kidney. Mr. Pearson, of Clapham, shewed me a quantity of fat

which came from an old woman; and said he could furnish me with any quantity. He understood from her, that it was discharged with the urine; but he mentioned the case of a lady, whom he knew very well, who discharged fat both with the urine and with the fæces. He did not attend upon her; but he had been in company with her. He had been particular to have the urine by itself; and also to ascertain whether the fat came from the bowels or not; and he clearly ascertained that it came from both. In this case of his, and in my case too, I think the motions were very white. They seemed to be of a viscid nature. It is a curious disease. Mr. Howship mentions a case, in his book on Morbid Anatomy, of a lady who discharged a great quantity of this fatty matter; and she was cured by giving her a pint of olive-oil. That was an odd remedy. He says she took a pint of olive-oil; and was well from that day, though she had been long ill previously. As "facts are stubborn things," I gave the man under my care four ounces of olive-oil; and the voiding of fat greatly diminished from that time, and soon ceased. Whether the circumstance was accidental or not, I cannot tell. You will find a case mentioned in "Hufeland's Journal," for 1826, of a quantity of thick oily matter being vomited. There was extreme emaciation; together with a rapid discharge of thick oily matter from the stomach.

I suppose you are aware, that the spermaceti-whale is liable to this disease;—that what is called *ambergris*, is fat collected in the intestines of spermaceti-whales. As much as one hundred and eighty-two pounds have been found in, or discharged from, the intestines of that animal; and it is said that it has never been found higher than six or seven feet above the anus. This fat is very often discharged, and found upon the shore; but occasionally it accumulates, and the animal dies;—either from the accumulation, or from disease forming in the intestine;—I do not know which.

GASTRO-INTESTINAL CONCRETIONS.

This leads me to speak of concretions of the alimentary canal; which concretions are sometimes discharged, and sometimes collected within; and as they are sometimes found in the stomach, as well as in the intestines, we may speak of them together; under the head of "gastro-intestinal concretions."

In the first place, these concretions may occur without any fault in the gastro-intestinal canal;—they may arise from the gall-passages. Of course if a gall-stone escapes from the ducts, but is not voided, it will be found in the stomach or intestines. Dr. Marcet says, that he once found in the alimentary canal, a stone, which came from the *urinary* passages. Ulceration had taken place; and a communication had been formed between the urinary and the fæcal passages. The rectum, in this case, was imperforate.

Occasionally very hard concretions are found. They are often nothing more than hardened fæces; and then they are called *scybalæ*; but occasionally they consist of articles which have been swallowed. I saw a man who had swallowed nineteen clasped knives. He was

not believed for some time, but he assured me that he had swallowed them; and, to convince me, he took out of his pocket one of the same size, as those he had already swallowed, and put it down his throat. I was frightened, and begged he would bring it up; but it was too far gone. Some persons believed him, and others did not; but at last we could feel them sticking in the abdomen; and ultimately they could be felt, I understand, in the rectum. He discharged fæces containing a large quantity of iron,—blackened; and at last he died in the most horrid torments;—the knives cutting his intestines to pieces. The fastenings of the knives, as solution went on, became less and less secure; the handles seperated; and the blades were let lose. After death, a great quantity of knives were found in his abdomen;—some having run through two or three-folds of the intestines. It was a frightful sight. Considerable portions of the knives were discharged during life; and those, together with what were found after death, are preserved at Guy's Hospital. The case is described by Dr. Marcet, in the first volume of the "Medico-Chirurgical Transactions."

When a person has taken a great quantity of chalk-mixture, and even magnesia, concretions have sometimes been formed. There is a preparation in the Museum at St. Thomas's Hospital, where the intestines of a child are completely blocked up with magnesia. It has the appearance of hard mortar regularly cemented; and is said to be magnesia. It is necessary, therefore, to be on your guard (when you are exhibiting chalk, or magnesia) not to give it too long without ordering a purgative,—so as to carry it away. There is a case on record of a person who had taken magnesia for a long time, and suffered a great deal; and who then suddenly discharged from the intestines, a large quantity of powder of magnesia. It is a fact that, from magnesia or chalk, the intestines sometimes become completely blocked up. The carbonate of iron will have the same effect. When you are giving that medicine in any quantity, it is necessary to see that the bowels are regularly opened. You may give an immense quantity, if you attend to that point. I related a case where a man took nearly two pounds of it, every day, for some days, when labouring under tetanus (of which he got well, by-the-by); and he regularly discharged large lumps of carbonate of iron. They came away as they would from a horse, covered with mucus, and giving him no pain whatever; but then he had a clyster to prevent any mischief. If a person do not attend to his bowels, a great accumulation may take place in the rectum, and the individual may be obliged to pick it out; but this must be from bad management. I have known cases of this sort occur, two or three times. I had another patient labouring under tetanus, to whom I gave this remedy, and he also got well; but if the nurses did not give him purgatives properly, he suffered pain in the rectum;—the rectum was distended, and became dry; and he was obliged to pick the iron out. In his bed was found a shovelful; which he had amused himself, day and night, in removing. I recollect an obstinate hyste-

rical girl, and also the case of a lady, in whom a similar accumulation took place; but in these cases, it arose from the patients' refusing to let us know the state of their bowels. It is right to know that, if you do not pay proper attention, such things may occur. Dr. Barlow (of Bath) mentions a case, where pills of sulphate of iron were discharged, a year after they had been taken. This is another general fact, shewing that articles may remain in the alimentary canal, for a long period, before they are voided. Substances which are liable to concrete should not be given, unless you attend to the bowels. Dr. Prout told me that he was sent for, a year ago, to see a lady from whom some odd things had come away. She had suffered excruciating pain; and it turned out to be from larks' bones. This lady had been in the habit of eating larks, of which some ladies are fond; and she munched the bones. She was a lady of title; but in consequence of this lark-eating, she suffered great pain. The substances discharged were sent to a celebrated chemist, at Tooting, in order that he might ascertain what they were. He first discovered them to be bones; and afterwards, from their figure, they were ascertained to be the bones of larks.

It was the fashion, a few years ago, (and I believe it has not yet quite gone out), for people to stuff themselves with whole mustard-seeds. They were thought to keep the bowels very open. Some said it was a good practice; and others distributed pamphlets and tracts, recommending it. Last year a gentleman came to me with various odd affections of the alimentary canal, which I could not well understand. Two days afterwards, he brought me a quantity of seeds that had come away; and I could not imagine what they were, till at last he told me he had been eating mustard-seeds, but had not eaten any for six weeks. He had given up the practice before he came to me; but they had accumulated in him, and actually remained for six weeks; and his danger arose from that. We know that they generally come away whole. One gentleman told me that he sowed some of these mustard-seeds, after they been passed through him; and they produced just as good salad as if he had not used them. Fashionable people have always some whim about them;—they are always taking something; but I believe the day of mustard-seed has pretty well passed by. Mustard-seeds will accumulate,—just like other things.

In cows, you very frequently find, in the alimentary canal, concretions consisting of hairs. They lick their skin; some of the hairs go down the throat with the saliva; and concrete together into a hard ball. They are found, not only in cows, but in many other animals. Millers' horses are said to be subject to these concretions, from the grit of the stone-dust in the mills; and particularly, it is said, when they are fed upon bran. The poor people in Scotland, who eat oaten bread, sometimes have concretions of this description,—formed of the beard of the oat. The outside of such concretions as these, is like velvet.

It is found that the earthly phosphates are frequently mixed with

hair, the beards of oats, or whatever else may have been swallowed, and become cemented together by the phosphates and the mucus. Sometimes, instead of the phosphates being mixed up with the other ingredients, they form into a concretion around a nucleus;—just the same as takes place in urinary calculi. The ammoniacal magnesian phosphates, particularly, will form around a nucleus of any sort. Sometimes the nucleus has been stale fruit; sometimes a piece of bone; sometimes a pin that has been swallowed; and sometimes a gall-stone. We shall see that it is the phosphates, in particular, that are formed around a layer in the urinary organs. In some of these concretions, oxide of iron, oxalate of lime, muriate of ammonia, and muriate of lime have been found. There was a lady who was said to discharge a large quantity of stones, from the urinary organs; but whether she told the truth, I do not know. A medical gentleman was attending her; and he wrote to his friends in London, to know whether they had seen similar wonders. It was very singular that two ladies, in different parts of the country, discharged similar stones; and both cases happened to come within my knowledge. Whether there was any deception or not, we could not tell; but Dr. Prout considered that, if there was not, the stones must have come from the intestines. There was said to be excruciating pain attending their discharge. The stones have the same appearances, and the same chemical qualities; they contain oxide of iron, and phosphate of lime. Dr. Prout considered, that many of these were too large to have passed from the urinary passages; and that the number the patient stated she had voided, must be incorrect. It is true that very large stones will pass through the female urethra; but they would have caused more suffering in the bladder than she complained of.

These gastro-intestinal concretions are sometimes, of course, very large. I recollect having read of the case of a woman, in whose stomach they were found nearly as large as a hen's egg. The same writer mentions finding some, which weighed four ounces, in a soldier's stomach. In the colon of a young child, one was found which weighed two ounces and a half, and was six inches long. The child died in consequence of it. In the "Philosophical Transactions," for 1686, there is an account of a woman who discharged many, varying in size from a pea to a filbert; and the weight of which amounted, in two years, to five pounds. In the thirty-second volume of the "Philosophical Transactions," there is an account of a pregnant woman, who discharged some concretions that were very large. One of them weighed above two ounces. It is a fact, therefore, that such concretions do occasionally occur. Sir H. Sloane mentions a case, where two hundred were said to be discharged.

These concretions are much larger in brutes, than in the human subject; and also more common. In a brute, one has been found weighing fifteen pounds twelve ounces. They chiefly occur in ruminant animals, and in horses of slow-draught, and in miller's horses, which are fed on bran. Both in the brute and the human

subject, these concretions are spheroidal or oblong. They take an imperfect polish, are more or less porous, and either are radiated, or have layers. Biliary concretions of both kinds occur;—some disposed in radii, and others in laminæ.

Those which are taken in small ruminant animals,—such as the antelope or the goat,—are called *bezoars*. The word is said to be derived from a Persian compound,—*pa-zahar*;—meaning *alexipharmic* (from αλεξεω, *to repel*; and φαρμακον, *a poison*). Bezoars were once so valued, on account of their supposed anti-poisonous properties, that one in the East, when very fine, has been sold for six thousand livres;* and has been hired, in Holland and Portugal, at the rate of a ducat† per day. I have some specimens; but some of them are probably artificial; for being sold at a great price, they were imitated. They were formerly sold at druggists' shops; and those before me I procured from an old druggist's. They are said to have concentric layers; and sometimes to be chrystallized. They will take a polish, and even have a metalic lustre. Mine have evidently been stained. Sometimes there is an accidental nucleus within; and they will rattle. They are found to consist chiefly of vegetable matter; and some have an aromatic smell;—from the circumstance of the animal having eaten aromatic herbs. It is said that it is only those which come from the West, that take a polish; and that the Eastern have often a gloss of white. The mode of distinguishing the genuine from the spurious, is said to be this;—if you take a piece of paper rubbed over with chalk or lime, and draw a genuine bezoar across it, it turns it green, or of an olive-colour; whereas, if it be spurious, the colour of the paper remains unchanged. However, the matter now possesses very little interest; since a belief in their virtue is no longer entertained.

Concretions in the alimentary canal, if retained, give rise to violent vomiting; and to violent gastrodynia, dyspepsia, colic, constipation, and death. From the obstruction which they produce, you have all the symptoms of enteritis, or of colic, or of strangulated hernia. The treatment, whether you know the nature of the concretion or not, is the same as for colic or enteritis; but as I said before, it is well to ascertain the state of the rectum. By passing a clyster up the rectum, you will have the means of learning whether the obstruction is situated there. Sometimes these concretions have reached the rectum, before they have been stopped.

ENGLISH CHOLERA.

Having spoken of gastro-intestinal concretions, the diseases which I shall now proceed to consider, will all be affections both of the stomach and intestines; and the first of which I shall speak is cholera, (from χολη, *bile*; and ρεω, *to flow*). This disease is characterized by

* About two hundred and sixty pounds sterling.

† A coin so called from being struck by dukes; and (when in silver) worth about four shillings and sixpence.

a sudden attack of bilious vomiting and purging. At first the discharge is sometimes thin and watery; and has been called *white vomit*; but very soon pure bile comes away;—in fact, unless there be a discharge of bile, it is not cholera. Besides this discharge of bile upwards and downwards, the disease is marked by severe pain in the abdomen; with very severe spasms of the abdominal muscles, of the calves of the legs, and (in very bad cases) even of the neck and back. There is no rigidity, (constant spasm,) as in tetanus; but violent contraction alternating with relaxation, and drawing the muscles up in lumps. There is great anxiety and great debility; burning heat, generally, at the pit of the stomach; and,—as you may well suppose, from such a quantity of bile being poured forth, —there is thirst and headache. These are the symptoms which we see, every autumn, in this country. At last, however, from this violent pain, and from this profuse discharge, the body becomes cold; great faintness is felt; perhaps there is actual syncope; the patient sinks; loses his power; becomes excessively weak; and then every thing occurs exactly as if hæmorrhage had taken place. General convulsions come on; the spasm ceases; and the patient dies, as if he had lost an immense quantity of blood.

This affection may last only a few hours, or it may last many days. Every body must have seen it seize persons early in the morning; and the persons so seized be dead in the middle of the day. If it subside, it may possibly be followed by inflammation. I have frequently seen gastro-enteritis take place, after the discharge had entirely ceased. The bile is generally found to be very acrid; and the vomiting and purging sometimes alternate; so that the more the patient vomits, the less he is purged; and *vice versâ*. Besides the bile discharged, there is usually a great secretion of another fluid;—no doubt, from the stomach and intestines. The same state may arise occasionally, from an overflow of the secretion of the mucous membrane of the stomach and intestines.

Intermittent and remittent fevers, and dysentery, in hot climates, very frequently begin as cholera;—I might say, perhaps, *with* cholera. The disease is common in hot climates; and in mild climates in hot weather. Cholera is particularly induced by sudden cold, after long-continued heat;—just the same as inflammation. It is observed, that occasional falls of rain are particularly followed by cholera, in hot seasons, and in hot climates. Dr. Macculloch ascribes this disease to malaria; and probably that is one of the causes; but various things will excite it. Violent passion,—violent emotion of mind, will cause it. From the latter circumstance, people are often vomited or purged, and sometimes both; and the discharge will be green;—so that cholera is one effect of violent grief. Some persons have this from certain ingesta. Any acrid substance may induce vomiting, or purging, or both; and in this case the discharge may be green; and therefore the affection may be cholera.

The mode of treating this affection is, in the first place, to give plenty of chicken-broth, or any other diluent; so as to dilute the

acrid bile, which produces such unpleasant effects on the stomach and intestines. You should also exhibit large doses of opium; either in the tincture, or in a solid form. Perhaps the latter would stay best on the stomach. It may be necessary, from the extreme weakness, to give brandy and other stimuli; and to have recourse to the hot-bath. The greater number of cases of cholera that we see, will do well if you give the patient warm diluents;—so as to dilute the bile, and assist nature to discharge it with as little irritation as possible to the stomach and intestines. But it is nevertheless advisible to lessen the disease, at the same time, by exhibiting full doses of laudanum. When the patient is weak, it may be necessary to have recourse to stimuli;—just as in the case of hæmorrhage. Should the disease chiefly consist of vomiting, it may be desirable to send the bile downwards; and calomel will then be the best medicine. It stays better on the stomach than any thing else. An injection may be found very useful. If the case be taken in time, and this mode of treatment adopted, it is very rare for patients to die. You have carefully to examine whether there is any congestion in the head, or any inflammation. After a time, these are very likely to occur; and it is necessary to treat them as you would in any other circumstances. After the disease, it may be necessary to give tonics, and to support the strength; or inflammation may come on; and then it may be necessary to bleed. Sometimes, after the affection has declined, the diarrhœa continues; and it may be necessary to check it in the usual way. But it is requisite to ascertain whether it is accompanied by inflammation or not; for it very frequently is.

This is cholera,—properly so called. As to that disease which has so unfortunately received the same name, and respecting which so much has lately been said, I shall speak of it next.

EPIDEMIC CHOLERA.

In 1817 a disease appeared in India, in some particulars like English cholera;—so far as there is a discharge upwards and downwards, severe pain in the abdomen, cramps of the extremities, and at length of the whole body, with great exhaustion. From its resemblance, in these particulars, to the other disease, it was unfortunately called *cholera morbus*; but there is this decided difference in the two affections;—that in what we understand (or did understand) by "cholera," the motions are all bilious; but in this, which broke out in India in 1817, the motions have no bile in them whatever, but are perfectly white and watery. On this account, if it were necessary to borrow a name from another disease to give to this, it would be better to call it *leucorrhœa* than "cholera." The discharge being white, "leucorrhœa" (from λευκος, *white*; and ρεω, *to flow*), certainly would have been a less objectionable name.

In the disease which broke out in India, the first symptoms were languor, uneasiness at the stomach, nausea, and common diarrhœa; and then, all at once,—about three or four o'clock in the morning,—violent vomiting and purging occurred; though, occasionally, these

took place without any premonitory symptoms. At the same time, or very soon afterwards, excessively severe spasms were felt in the extremities, and in the abdominal muscles; so as not only to make the patient exclaim with agony, but sometimes to make it necessary to call in the aid of several persons to hold him. The countenance, in a short time, became ghastly; the skin shrivelled; the features contracted and elongated; the eyes a little suffused, slightly tinged with red, and sunk in the sockets; the lips purple, or of a black cast; the base of the eyelids likewise purple; the skin and the nails blue; and the fingers not only shrunk, but shrivelled;—exactly like the hands of an old washerwoman. At the same time, there was extreme thirst; with a great sensation of heat in the throat. The temperature of the whole body was excessively low; the tongue and the breath were cold; sometimes the tongue was quite clean, and of the colour of lead; but occasionally it was white, and had a tough, or (as it has been described) a leathery coat; and occasionally it was covered with sordes, but by no means always. The pulse became exceedingly weak, and exceedingly quick; and at last it could not be felt at all in the wrists, though it might still be perceived at the heart. Extreme restlessness took place; so that the patient could scarcely bear the bed-clothes, and endeavoured to toss them off. The breathing, like the pulse, became more rapid than in health. It was found that, in the expirations, only one-third of the usual quantity of carbonic acid was given off. The blood that was taken was found to be thick;—some say pitchy and uncoagulable. The venous and arterial blood were equally black; and, in the worst cases, the blood would not flow at all. It was likewise observed that no urine was discharged. Deafness was noticed as a frequent symptom; and also tenesmus. Occasionally, however, there was scarcely any vomiting; but extreme debility; together with extreme loss of bulk, shrinking of the body, the corrugated state of the fingers, and the violent spasms. These cases were considered to be worse than those in which vomiting and purging took place. This disease differs from our cholera, in there being danger where there are scarcely any evacuations;—the danger of the disease not depending upon, and not being in proportion to, the loss of the substance of the body. Sometimes it is said that, in addition to there being neither vomiting nor purging, no spasm was felt; and this was considered still worse. The patient was said to be "struck with death;" his pulse became imperceptible; and death very soon closed the scene.

There was great irregularity as to the occurrence of these things. Patients sometimes vomited and were purged, before they experienced spasms; and sometimes spasms occurred at the onset of the disease. Occasionally, blueness of the nose and about the eyelids was not observed; and sometimes there was no corrugation. There was by no means uniformity in the symptoms. Before death, it was very usual to find the spasms, the vomiting, and the purging cease; and for the patient to lie perfectly still, with the loss of the

vigour of his mind, but with a perfect preservation of his reason. He would be conscious of all around him, but wish not to be disturbed; and he would take no nourishment. He would remain tranquil; as if he were waiting for the moment of death. When the patient was lying in this quiet state,—patiently waiting, as it were, for death,—the pulse at the wrist would not only be still, but sometimes the action of the heart could not be felt;—at least it was so said. Whether the ear was employed to ascertain whether the heart acted or not, I do not know. I presume it is common enough, in different diseases, for the pulse not to be felt, when the heart still continues to beat. Before death, it was occasionally noticed that the temperature would return; and hopes of recovery were sometimes entertained; but these were, for the most part, unfounded; for the patient presently sunk. It was likewise observed that, after this extreme exhaustion, the face would sometimes become flushed, the temporal arteries become distended and throb, and the patient lie in a somewhat delirious or comatose state;—much in the condition of a person in typhus fever. The voice was weak and very peculiar. The duration of the disease was sometimes only a couple of hours; and sometimes it would not destroy life for the greater part of a day. After death, an immense quantity of white turbid fluid, with flakes of a very white substance, were found in the stomach and in the intestines; while no fluid whatever was found in the urinary bladder, and that organ was contracted to the smallest possible size. These were general occurrences. It was usual for neither fæces nor bile to be found in the alimentary canal; but the gall-bladder generally (not always) was found full, and sometimes it was remarkably distended;—so that there was no want of bile, but none passed into the alimentary canal. The veins were usually found greatly distended with blood; so that the hepatic, intestinal, and mesenteric veins, were remarkably distended; but those of the spleen were not quite so full. Congestion also occurred very frequently in the lungs and in the head. Sometimes there was a rosiness of the external surface of the alimentary canal; and sometimes of the *internal* surface. There was usually, too, a great congestion of blood in the heart itself. The abdominal muscles were found, by Dr. Davy, to be flabby and red; but, of course, not inflamed. The urinary bladder,—although containing no urine, and being so greatly contracted,—had generally a sort of whitish mucus, with flakes, upon the inner surface. After death, one very remarkable phenomena presented itself; which was, that the temperature of the body was higher than during life; so that a very high degree of heat was found, on plunging the hand into the body. Another very remarkable circumstance is mentioned;—the occurrence of a twitching of the different muscles of the body, after the person was completely dead. The fingers, the toes, and every part of the face, were seen to move. Observations of this description were made on two subjects;—the one a Caffre, and the other a Malay. The former died twenty hours after the first seizure;—the complaint baffling the most powerful remedies. In fifteen minutes after he

expired, the fingers of the left hand were observed to move; then the muscles of the inside of the left arm were contracted in a convulsive manner; and the like motions were slowly propagated upwards to the pectoral muscles. The muscles of the calves of the legs contracted in like manner;—bundles of their fibres being drawn together, in a tremulous knot. The muscles of the inside of the leg and thigh were forcibly contracted, in a vermicular manner. The muscles of the face and lower jaw were similarly affected; and, finally, those of the right arm and right pectoral muscle. These motions increased, in extent and activity, for ten minutes; after which they gradually declined, and ceased twenty minutes after they began. With regard to the Malay, about fifteen minutes after he expired, the toes began to move in various directions; and the feet were made to approach each other. Muscular contractions were speedily propagated upwards, along the inside of the legs and thighs. The thighs were turned slowly inwards, so as to approach each other, and again outwards;—the whole of the lower extremities moving on the heels, as on pivots. These motions proceeded upwards;—producing a quivering in the muscles. In five minutes, the upper extremities began to be similarly affected. The fingers were extended, and often rigidly bent inwards; and pronation and supination of the hand were steadily, though slowly, performed. The same quiverings were observable as in the lower extremities; and extended to the pectoralis-major muscles, and the superior margin of the latissimus dorsi. The muscles of the face moved; and the head was observed to shake. The total duration of these appearances, was half an hour. By moving or pricking the arms or limbs, these contractions were rendered stronger, and were again renewed where they had ceased.

This is the account which has been given by various writers, who witnessed the disease in India. I will now describe to you the disease which has lately prevailed in London.

Among the patients whom I have seen, there has been a great variety as to the mode of attack; and as to the order of the symptoms after the disease has begun. With regard to the first point,—the mode of attack, some persons have been seized suddenly; while others have had diarrhœa for some time previously. Those who were suddenly attacked, were generally seized early in the morning, after going to bed perfectly well; and discharged, by vomiting and purging, a turbid whitish fluid, containing white flakes. There was violent pain in the abdomen; violent pain in the extremities; and dreadful cramps in the fingers, toes, arms, and legs. In two or three hours from the moment of the attack, I have seen the eyes sunk in the sockets; blueness round the base of the eyes; blueness of the nails; in some cases, blueness somewhere upon the extremities; in one case, blueness of the whole body; no discharge of urine; intense thirst; a great sensation of heat within; extreme restlessness; the tongue of a colour like lead; and (in the case in which the body was blue all over) covered with a white and leathery crust; a very feeble pulse; and, at last, no pulse whatever in the extre-

mities, although it could be felt at the heart. The pulse and the respiration were very rapid. I have counted the respirations at thirty-six in a minute. There has been a great fall of temperature; so that the hands, the tongue, and the breath (as it came from the body) were cold. On passing a thermometer into the mouth, I have found it as low as *eighty-four* degrees;—ranging only, at any rate, between *eighty* and *ninety* degrees. There has been a cold sweat on the extremities; and then, at last, the patient would remain free from all restlessness;—free from pain,—free from vomiting; and would lie perfectly still, conscious of everything, but with a desire not to make the least exertion,—apparently tranquil, and waiting for his dissolution. Then, before death, I have noticed the temperature rise,—the coldness cease; and after death the temperature has risen still more. I may mention that, in the case where there was such great blueness, no sooner had the patient expired, than the blueness was diminished. I did not observe whether it diminished before death, but I noticed it immediately afterwards; and, in an hour, there was nothing of the colour to be seen. There was a twitching of the muscles; so that one finger, after death, would be drawn in, and then another; and the lower jaw would move up and down; and you might see a quivering of the muscles inside the thighs. The voice was weak; and there was a great peculiarity in it.

After death, the stomach and intestines were usually found filled with a white fluid, containing white flakes. There were various appearances of the alimentary canal, both internally and externally. Sometimes it was rosy, and sometimes pale. The urinary bladder was empty, and exceedingly contracted. The congestion in the venous system was very great. The mesenteric veins were full; and the venæ cavæ appeared distended to the utmost. They looked like a bell-rope in a drawing-room. The heart was observed to be full; and the blood, both in the ventricles and auricles, was grumous,—half-coagulated. There was sometimes congestion in the head; and sometimes in the lungs.

No one possessed of common sense can doubt, for a moment, that the disease which occurred in India, and that which we have seen here, are precisely the same. I should think no one can doubt, that it is different from the disease commonly called *cholera*; which is marked by a discharge of bile, and in which the danger is in proportion to the extent of the evacuations. It cannot be said that this disease is only a severe form of common cholera; because the mildest cases are not at all like common cholera;—they are not characterized by a discharge of bile. If it were cholera, only very severe, the mild cases ought to be equal to the very severe ones of the common cholera of this country; but instead of that, they are all characterized by an absence of bile, and by these peculiar dejections.

Again, it has been said that this disease is not only essentially common cholera, but that it is a disease we have all seen. I raise my voice in saying, that it is a disease which I never saw before;

and I think that, if it had previously occurred in London, I, from being connected with a large institution,* should have seen it; but I certainly never saw any affection that bore the least analogy to it. It would not be more absurd to say, that measles and common bronchitis are the same, because in both there are certain morbid appearances in the air-passages; than it is to say that, because there is vomiting and purging in this disease as well as in common cholera, that they are the same. A variety of diseases of the skin, which are distinct from each other, have an appearance in common; and measles, scarlet fever, and other affections, were formerly all jumbled together. No diagnosis was made between them;—simply because there was redness of skin.

If you look at Celsus and Sydenham, you will find that the cholera which they describe, is very different from this affection. Sydenham says it prevails at the end of summer and during the autumn, as regularly as vegetation comes in spring; whereas this disease occurs at all seasons, and has no connexion whatever with heat. Sydenham describes it as a discharge of *bile*; and not of the peculiar fluid which we see in this affection. I cannot but believe that it is totally distinct from common cholera; and that it is a disease never seen before in England. I have conversed with practitioners older than myself, —with men of the greatest experience; and they declare that they have never met with such a disease before.

I may now detail some few particulars respecting the disease. It was thought, in India, that the natives suffered from it more than the Europeans. Thousands of natives perished near Bombay; while of the Europeans, who had good food and good clothing, six only were affected. It was found to attack those who had the worst diet, who were the worst clothed, and were worst of in all respects. It was found to prevail at all temperatures, and all seasons;—in *healthy* and in *unhealthy* situations; both in *dry* and in *moist* places. It prevailed in spite of the monsoons; and not only in every direction of the wind, but in all hydrometic states of the atmosphere. There was great doubt whether it was contagious or not. Some thought it proceeded where there was no communication, just as well as when there was. It was found suddenly to stop without any apparent reason, and then to go on again;—to pass from one district to another, as regularly as any other disease would; and then, as soon as it ceased in one place, it would begin in another. It was said that it broke out in the Mauritius, three thousand miles from a place where it had prevailed; but it was after a vessel had arrived from that spot. If you read the accounts of the disease as it appeared in different countries, you find a mass of evidence tending to prove that it is contagious; and then you find a mass of doubtful circumstances, which unsettle your mind again.

I need not say that it turned, at last, towards Europe; and proceeded, pursuing a north-westerly direction, till at last it reached this country; and with all the observations that can be made, it is

* St. Thomas's Hospital.

still a matter of doubt whether it is contagious or not. The particulars observed here and on the continent, however, perfectly agree with what I have stated; namely, that the poor have been affected much more than the rich; and that those who are the worst fed, clothed, and lodged, have all suffered in the greatest degree. We have a striking example of this, so far as the disease has hitherto proceeded, in contrasting its ravages in London, with those it made in Paris. Here the greater part of the people are well fed;—better fed than in any other part of the world. They eat more flesh; and that flesh is of such a quality, as is scarcely to be found in any other country. Besides this, they are better clothed, and more comfortable; and instead of trashy wines, they have good sound ale and porter, and malt liquor of all kinds. But in Paris the air is bad; the people have very little water; and the water, for the purposes of consumption, is very bad. The inhabitants are crowded together,—I know not how many families in a house,—with little ventilation. The streets are narrow; and, together with this, the houses are dirty. The population live upon what we Englishmen consider trash;—not roast beef and mutton; but all sorts of dishes made up of bread and vegetables, with a little meat boiled in water to colour it, or to give it a flavour; and they drink, not good beer, but thin wine; and we all know that this disease has committed infinitely more ravages,—done infinitely more mischief there, than it has here. This completely accords with what was observed in India.

With regard to contagion, we have in this country many observations, which tend to shew that the disease is contagious; and then, again, we have cases occurring, where we cannot imagine communication could have taken place. You will see, in the "Medical Gazette," (Volume X. Page 31), a reference to a work by Dr. Haslewood; in which several facts are mentioned, which go to shew the contagiousness of the disease; and these, together with facts which I have noticed myself, have created a strong suspicion in my mind, that it is contagious. But while I am inclined to believe that to be the case, yet I am also satisfied that it will spread without contagion at all. It may spread independently of contagion; but if the disease do occur in an individual, I cannot but think that that individual may communicate it to another. Of course you will find a large number of exceptions to its spreading, where you might, *à priori*, expect that it *would* spread. The disease has great difficulty in attacking those who are in good health, and well off; and in this respect it differs from syphilis, itch, and small-pox; and therefore, though thousands may be exposed to the contagion of the disease, (if contagion really exist), yet they will be almost sure to escape. This must be taken into consideration, when you consider whether the disease is contagious or not. If a number of persons be exposed to it, and escape, yet that is nothing more than we should expect.

With regard to the *fatality* of the disease, it was observed, in India, that much good was done by medical treatment. It is said that, at Bombay,—where there were from two hundred thousand to two hun-

dred and twenty thousand inhabitants,—there were fifteen thousand nine hundred and forty-five cases. Of these one thousand two hundred and ninety-four took no medicine, and all died; but where medicine was employed, the deaths were much reduced. It was supposed there,—at least, it was so stated in books at the time,—that by the administration of large doses of calomel and opium, occasional bleeding, and the hot-bath, great good was effected; and that many lives were saved. Some persons gave calomel in *small* doses; and some gave scruples, with a drachm of laudanum;—altering this according to circumstances. Others bled their patients, when they could get blood to come; and it was said that that treatment, also, was very successful. Some practitioners adopted both plans. Some strongly recommended the use of magnesia, and other absorbents. Indeed, one celebrated writer says, that magnesia and absorbent specifics have saved thousands of lives. Such was the treatment there; and the success, as I have stated, was considered to be very great.

It was well ascertained in London, that not only those who were badly off, and in bad health from some other disease, but those who are in the habit of drinking spirits, have been very liable to the disease. I do not know that such an observation was made in India; but I presume that drunkards there suffered,—the same as here. In Europe, however, it is an undoubted fact, that that portion of the lower orders who had every thing calculated to keep them in good health, but who indulged in spirit-drinking, were sure to suffer; and this has been observed with regard to other diseases. However well persons may be off, yet if their body be enfeebled, they are rendered increasingly liable to the disease.

With regard to the treatment in this country, I cannot but think that if all the patients had been left alone, the mortality would have been the same as it has been. I think that, if all the persons attacked with cholera had been put into warm beds, made comfortable, and left alone,—although many would have died who have been saved,—yet, on the whole, I think the mortality would not have been greater than after all that has been done; for we are not in the least more informed as to the proper remedies, than we were when the first case of cholera occurred;—we have not been instructed, in the least, by those who have had the disease to treat. Some say that they have cured the disease by bleeding; others by calomel; others by opium; and others, again, say that opium does harm. No doubt many poor creatures have died uncomfortably, who would have died tranquilly if nothing had been done to them. Some have been placed in hot water, or in hot air, and had opium and calomel, and other stimulants; which, altogether, were more than their system would bear, and more than would have been borne if they had been so treated even in perfect health.

I am sorry to say that, of the cases I have had to treat, the patients have nearly all died. I tried two or three sorts of treatment. Some had opium and calomel, in large and full doses; but they died. Hot air was applied externally; and I got two to *breathe* hot air. I had a tube passed through boiling water; so that they

might inhale hot air. It was found vain to attempt to warm people by hot air applied *externally*. They were nearly as cold as before; —you could not raise their temperature; and therefore I thought of making them breathe hot air; but both patients died, about the period that death usually takes place. It was said that saline treatment was likely to be of use; and I accordingly tried it in some patients. At first I exhibited half a drachm of carbonate of soda, every hour; and thinking that might not be quite enough, I exhibited a drachm; and in one patient at St. Thomas's Hospital, I ordered an injection containing an ounce of the same remedy; but the greater part of it came away, and the patient died. Hot air was used in this case, as well as in the others.

This leads me to speak of the chemical qualities of the blood, and of the discharge from the alimentary canal. It has been said that the contents of the latter were *alkaline*; but I examined that point, in several cases where no alkali had been taken; and so far from the observation being correct, I found them exceedingly *acid*. In the case of a man who was blue from head to foot, and who had twitches after death, the contents of the stomach were exceedingly acid; but the intestinal matters were less and less so, as we went downwards, till we got to the large intestines; and there they were natural. In the patient who took large doses of the carbonate of soda, and had an ounce thrown up, the contents of the stomach were then only neutral, while those of the intestines were acid. When we came to the rectum, where some of the carbonate of soda that had been injected still remained, they were alkaline. The cases that I have examined, have not been numerous; but in all of them the contents have been principally acid; and in no case were they alkaline, except in the one I have just mentioned.

Dr. O'Shaughnessy has published some observations and experiments on this subject. He says:—"The summary of my experiments may be described as denoting a great, but variable deficiency of water in the blood, in four malignant cholera cases; a total absence of carbonate of soda in two of them; its occurrence in an almost infinitesimally small proportion in one; and a remarkable diminution of the other saline ingredients in all." It would appear, from these four cases, that there is less serum in the blood; and therefore you see why it is thicker in this disease than in health; and that there are also less saline ingredients in it. "Again," he says, "in the dejections passed by one of the patients whose blood was analyzed, we found a preponderance of alkali; and we recovered the other saline matters deficient in the blood." Thus he supposes that the blood loses its saline particles; that they are discharged into the intestines; and that you find them there, in the same proportion as the blood has lost them. But although that may be the case, it is not clear that the dejections are of an alkaline quality;—that is to say, that there is an excess of alkali in them.

I really can tell you nothing with regard to the treatment; but I know that patients feel intense heat within, and intense thirst; and

that they find great comfort from cold drinks. I understand that, in Vienna, the custom was to allow ice; which the patients took with great avidity, and derived great comfort from it.*

DISORDERS OF THE DIGESTIVE ORGANS.

The disease of which I shall now speak, is commonly called indigestion; but I would rather speak of it under the denomination of "disorder of the digestive organs at large;" because "indigestion" applies to affections simply of the stomach; whereas this affection implicates the intestines as well as the stomach; and, indeed, all the organs concerned, not only in chylification, but also in excretion.

Now "indigestion" is usually termed in medicine *dyspepsia*; and you will sometimes find it mentioned under the name of *apepsia*; the one meaning "*difficult* digestion," (from δυς, *difficulty*; and πεπτω, *to concoct*); and the other "*no* digestion" at all, (from α, *privative*; and πεπτω, *to concoct*). However, these all mean precisely the same thing. We are now, therefore, to consider that derangement of the digestive organs, which is generally attended with indigestion; but many of the symptoms of which take place *without* indigestion. Many persons will digest very well; and yet, when they have no food in the stomach, they are filled with wind. But this ceases on food being taken.

If any organ in the body suffer severely, the stomach is very much disposed to sympathize with it. The stomach, the heart, and the head, are particularly affected when any material derangement occurs in the frame,—the stomach more particularly, perhaps, than either of the others; and the intestines generally become more or less affected at the same time. You know that, in all acute diseases, —in all violent accidents, the stomach feels the shock. There is anorexia (loss of appetite), frequently nausea and vomiting, and either costiveness or purging. The fæces generally become depraved in their quality; uneasiness is usually felt in the stomach or intestines: and there is perhaps, even pain and tenderness. Very frequently, the patient is rendered more uncomfortable by the sympathetic disturbance of the stomach and bowels, than by the original affection itself. In chronic diseases (as, for instance, diseases of the heart, liver, and lungs) the stomach and intestines are most mate-

* We have already spoken (see page 247) of the admirable arrangements adopted at the Cholera Hospital, Drummond Street, Edinburgh; under the able superintendence of Dr. Mackintosh, and Mr. Meikle, E.I.C.S. Since that note was written, intelligence has arrived in England of the death of the last-named gentleman, after nearly thirty years' active and efficient service in India. The premature decease of both these highly qualified and enterprising medical officers, leads us to fear that the records of the Hospital in question,—in which every feasible plan of treatment was tried, and every fatal case was followed to the dissecting-room,—are now not likely ever to be laid before the profession at large. We happen to know that an extended series of cases was prepared for publication with great care; and we regret that the publication thus intended never took place. In the Appendix, No. XIII, we shall give a specimen of these cases; in illustration of Dr. Elliotson's remarks on the treatment and morbid appearances of Malignant Cholera.

rially affected. But besides these effects,—mere *sympathetic* occurrences, from the derangement of other organs,—we have these parts deranged *originally*.

I will now proceed to consider all the symptoms, which characterize those affections which pass, every day, under the name of "derangement of the digestive organs." In the first place, loss of appetite is a very common symptom; and this is called, in medical language, *anorexia*, (from α, *privative*; and ορεξις, *appetite*, sometimes, however, the appetite is not *lost*; it is only *irregular*;—the patient being able to eat well one day, though he cannot eat another. Sometimes the anorexia amounts to loathing;—the patient not only cannot eat, but the idea of it disgusts him.

Sometimes the appetite is not simply *deficient*, but is *depraved*. This is particularly seen in females; and is called *pica* (*a magpie*; —an animal said to be subject to this complaint). You will sometimes see young ladies long for chalk, cinders, or sand; and they will bite glass,—munch it; and when it is small enough, they will swallow some of it. I saw a lady, the other day, who ate *brown* paper; not paper hot-pressed and gilt-edged, but *brown* paper. She longed for something to eat; but did not know what. She wished for something that she had never ate before; but she could not tell what;—nor could I. I have heard of cases where the patient longed for raw flesh, and even for *live* flesh; so that some have eaten live kittens and rats. This is an absolute fact. In the same way, some have been known to long for the contents of snuffers; and even for manure. A case is described of a man who ate a live pig,—leaving the intestines; but, after a little while, he ate them also. There is a case described, at full length, in a German work, of a boy who had such a longing for lime, that he ate all the mortar he could pick out of the wall; and being well horsewhipped for it, he then commenced on a *neighbour's* wall. In order to prevent this however, the neighbour smeared the wall with a decoction of wormwood, and the boy could no longer relish it; but he then went to the kennel in the street, and sucked up the sand. He had a desire for something dirty. After this he got to some quick lime; and was forced to drink a large quantity of water, to extinguish his thirst. The mucous membrane within, had a distaste for what is called "*good* food;" but, in other respects, he was quite well. I recollect having read of a girl, and also of a student at Leyden, who always ate spiders when they could get them; and no harm arose from it. I have read of a man who disliked bread, and never ate it; but he was seized with a quartan ague, and then ate a large quantity. He recovered from the ague; and the disgust towards bread returned again. You know that this disease occurs in young women (even moral ones) who do not menstruate well;—as I mentioned when speaking of chlorosis; and many pregnant women have some strange longing of this description. Every one must have met with instances of women longing for what it was difficult to get;—longing for things out of season. There was one who longed for a bit of the priest's sleeve, and contrived to get at it and bite it;—not caring for

his excommunication. I could relate cases, almost without end, of this description. One dipped her bread in a tar-tub. I never met with these extreme cases; but every one must have read of instances of this nature.

Sometimes, however, the appetite is *excessive*; so that people will eat an immense quantity. This is called *bulimia* (from βου, *excessive*; and λιμος, *food*). You will recollect that I mentioned, when speaking of fever, that this has sometimes occurred as a temporary symptom of another disease. People will eat many pounds of meat and bread, in the course of a day.

Besides these affections, the stomach sometimes experiences attacks of nausea and vomiting. Some vomit only the food they take; others vomit a viscid secretion. Some vomit more or less constantly; and some vomit only in the morning;—and, in the latter case, it usually arises from drinking. When the disease has become very severe, some will vomit on the slightest motion. Then again, you will frequently find people, labouring under this affection, complain of intense thirst; and their tongue is foul, and covered with a yellow or a creamy mucus. Sometimes it is white, dry, and brown; but whatever appearance it has, it is worst in the morning. It is frequently red at the same time,—either at the tip or at the edges. Sometimes it is the papillæ only that are red. They appear separate;—like granules of cayenne pepper. Sometimes the tongue is red all over; and it may be moist, dry, glazed, or cracked.

There is frequently fœtor of the breath. Sometimes the smell is sour;—sometimes it gives you the idea of sour flesh; sometimes it is like cabbage-water; and occasionally it is absolutely fœcal;—so that it is impossible to stand near the patient. I mentioned that the most horrid kind of fœtid breath, frequently arises from a depraved secretion within the tonsils. Of course you will have a diseased odour of the breath, from other circumstances than any of these. It will arise from a diseased bone; and sometimes even from carious teeth. This is not so disagreeable to others; but it is very unpleasant to the patient himself,—from there being a bad taste in his mouth. Sometimes the taste is bitter; and sometimes, they say, it is particularly offensive.

Eructations are very common in this affection; and these may be either simple or fœtid. Those which are inodorous, are generally experienced when the stomach is empty; and probably arise from a secretion of air by the surface of the stomach; but those which are fœtid arise, I presume, from the contents of the stomach undergoing a certain degree of fermentation, or sometimes from the patient being costive. It appears that a portion of the fæcal odour, if not of the fæces, is absorbed; for some persons who are exceedingly costive, have very fœtid eructations; which are removed by regulating their bowels. In some persons, it is only when certain articles are taken, that the breath becomes offensive. Sulphuretted hydrogen appears to be given off from the substances in question.

It is very common for the mouth to become filled with watery fluid; and often very suddenly. Sometimes you will see the patient's

mouth constantly open. I have seen patients spit a pint a day. Occasionally the fluid is tasteless; but more frequently it is salt, or sour; and occasionally it is very acrid indeed;—containing a large quantity of muriatic acid. I believe it is often felt to be very cold. Patients complain of its coming up, as if it proceeded immediately from a spring. Independently of this fluid, there is frequently an excessive quantity of viscid mucus;—chiefly hanging from the pharynx; and causing a constant desire, on the part of the patient, to hawk it up. Many cases of this description, are mistaken for affections of the air-passages. I was myself, for some time, completely in the dark respecting it;—conceiving that persons had a constant discharge from the air-passages, when they had nothing more than indigestion. The vomiting may either be of simple food which has become exceedingly sour and acrid, or fœtid; or it may be of bile; so that you have every variety of vomiting;—just as you have every variety with regard to the appetite, with regard to the appearance of the tongue, and with regard to the eructations.

To descend lower, there is tightness and fulness of the abdomen;—chiefly at the epigastrium, and chiefly after meals. Frequently there is an aching there; and sometimes excessive pain. Occasionally this is experienced only after meals; and occasionally only when the stomach is empty. This pain, if it be unaccompanied with inflammation, passes under the name of *gastrodynia* (from γαστηρ, *the stomach*; and οδυνη, *pain*); and if, with this, there is a flow of fluid into the mouth, the two circumstances together are called "water-brash," or *pyrosis* (from πυροω, *to burn*). The pain is sometimes sudden,—comes on instantly, or at least very rapidly; and is excruciating. It darts back, perhaps, to the spine; and causes the extremities and face to become cold, the pulse to be small, and the surface pale. It passes under the name of "spasm of the stomach." Very frequently, at the same time, there is a large discharge of flatus through the œsophagus;—flatus which is usually inodorous. This pain frequently runs to the left shoulder, and down the left arm;—like the pain experienced in *angina pectoris*. I have known it run down both arms, and also run up the jaws, and along the teeth. Sudden attacks of this affection, are seen more commonly in women, than in men. The pain is not always felt precisely in the situation of the stomach itself; but occasionally in the shoulder-blades, and occasionally in the ribs;—even in those which are not over the stomach; though the pain is dependent on that organ. In my own case, I have occasionally laboured under this pain severely; and I have been able to get rid of it by putting my fingers into my throat, and discharging a quantity of sour stuff. When the pain in the ribs returned again, by making so slight an effort as hardly to be called "vomiting," but sufficient to discharge a quantity of stuff like birdlime, I have invariably found the pain go away. If I had not paid attention to the stomach, I could not have believed that the pain arose from that organ. The pain is sometimes felt even at a distance;—in the calves of the legs, for instance. Frequently, when

there is much disturbance of the stomach, the legs fall into a state of violent cramp; the most common cause of which, is the presence of acid in the stomach.

Besides this *spasmodic* pain,—which, for the most part comes on suddenly; or, if it exist constantly, is attended with exacerbations; and is not increased by pressure, there is frequently *inflammatory* pain;—not *gastrodynia*, but *gastritic* pain; so that the stomach is tender on pressure, and all ingesta produce great agony. A sensation of heat is induced in the stomach, and up the throat. In some cases, you will find a throbbing of the epigastrium,—a violent pulsation; which no doubt has been mistaken, over and over again, for aneurism; and which patients themselves are inclined to believe is aneurism; because, in this state of things, they are much disposed to despond. This has been called *cardialgia* (from καρδια, *the heart*; and αλγος, *pain*); and has been referred, by Sauvages, to a morbid sensibility of the part. Dr. Baillie wrote a paper on this subject, in the first volume of the "Transactions of the College of Physicians;" in which he stated that he had been consulted, several times, on this affection; which had been supposed to be aneurism; but which he had not found to be so. He opened persons who died from some other disease, while labouring under this; and found nothing morbid. It is a common symptom;—one which I have frequently been consulted upon; but you find no tumor. On pressing the part, you feel the shape as usual; and you find, at the same time, a great depression of spirits; and, more frequently than not, various symptoms of disorder of the digestive organs. On looking over Sauvages, I find he has described it as a dyspeptic symptom; and has referred it to a morbid sensibility of the arterial system of the part. He says it is certain that the gastric arteries and the aorta, although not affected with aneurism, yet, in those who are constantly hypochondriacal and hysterical, acquire an exquisite sensibility, and produce this state. Occasionally the heat is far beyond what I have just mentioned. It is a *burning* pain; and patients usually speak of it as a "*burning* sensation." It arises, in most instances, from the quantity of acid produced in the stomach; and if there be any inflammation of the mucous membrane, the pain will be proportionately severe.

The bowels are generally irregular; and, for the most part, they are torpid; but sometimes they are relaxed. In other cases you find an alternation of costiveness and relaxation; so that they are never right. The fæces, too, are frequently unhealthy. Frequently you observe them lumpy; but they are of various morbid degrees of consistence, and of various morbid colours; and frequently they are not of their usual smell. Sometimes there is a great want of bile; and sometimes there is even a degree of icterus. From the irritation of the stomach, the urine usually becomes high-coloured; but at other times,—especially when there is a great quantity of wind generated in the stomach itself,—the urine becomes excessive in quantity, and pale;—just as in asthma.

Other parts of the body, however, suffer as well as the gastro-intestinal, or (as it is used to be called) the alimentary canal. There is frequently headache,—either general, or particularly in the forehead; and very frequently it is confined to one part of the forehead,—to one brow. Sometimes it is intermittent; and sometimes absolutely periodical. I have no doubt, however, that occasionally this headache does not arise from the state of the stomach; for disturbance of that organ may be produced by cold, or vexation of mind; and then, when it comes to be very severe, it will make a person sick. On the other hand, it arises every day from taking things into the stomach which disagree with it. I formerly mentioned how hereditary this description of headache is,—how frequently we see it in fathers and in children;—how frequently it occurs in many members of the same family. Sometimes it will come on at *regular*, and sometimes at *irregular* intervals;—disappearing, perhaps, after a certain number of years. It is so obstinate, that I do not recollect curing a case of it; though I have tried every thing that could be devised.

Frequently, in this disease, there is confusion of mind. Patients cannot apply themselves as they did before. They cannot read long; and I have known some obliged to give up study altogether. Frequently there is vertigo, heaviness of the head, and sleepiness; but, on the other hand, when the stomach is much deranged, it is common for persons to lie awake;—they find it impossible to go to sleep. There is frequently, too, a ringing in the ears,—*tinnitus aurium*; and specks appearing before the eyes,—*muscæ volitantes*. There is frequently great sadness,—great depression of spirits. Patients are very restless and fidgetty; and sometimes their temper is very irregular; so that you must take care not to say many things which, at other times, you might say with impunity. Voltaire, you will recollect, gives special directions to those going to ask a favour of the Prime Minister. He tells you to ascertain whether he has had his bowels opened in the morning;—so much does temper depend upon the alimentary canal. He says you should always go to the *valet de chambre*, and ask if all has gone on regularly; and if you find that it has, then you may ask your favour.

The heart also sympathizes with the stomach. There is frequently palpitation in these cases; and sometimes an intermittent pulse. Frequently there is night-mare, or terrific dreams. A partial consciousness, and yet an inability to make a voluntary exertion, come on during sleep; but when patients can make an effort, they imagine they get out of this condition. Incubus is a very common symptom. There is frequently, too, a sense of great debility; which is felt particularly at the pit of the stomach. You hear patients complain of this every day;—they say they feel as if their inside were all gone to decay. Sometimes there is a tremor of the whole body. The skin likewise suffers. It is generally dry and cold; but sometimes it is hot.

Persons sometimes have merely an inability to digest food; and are very well so long as there is no food in the stomach. But true

dyspepsia,) that is to say, that affection which depends upon the stomach performing its functions improperly; and which is worse after eating, or indeed is only experienced then) is attended with other symptoms. There is loss of appetite, vomiting, distant pain, and the other symptoms which I have mentioned; but you will frequently have these without much indigestion. You will find persons complain of a great sinking at the pit of the stomach; they will also have gastrodynia and pyrosis; and yet they will digest their food well,—have no dyspepsia; although there is derangement of the stomach. They are very well when they take food; and only suffer when the stomach is empty. Some of these things are merely called "indigestion." Some patients have none of these symptoms; and some may have one or other, or both together. Persons who suffer in this way, frequently become pale and emaciated. They live many years; but they are never well. They are not ill enough to die; but their complexion becomes altered.

The cause of all these symptoms, and of all this derangement, may be *beyond* the stomach or intestines;—they themselves being disposed to be perfectly healthy; or, again, the causes may be in those very organs. In the first place, the cause may be in the groin. A hernia will produce all these symptoms. If a person have a rupture, he is sure to be troubled with irregularity of bowels, costiveness, extreme flatulence, and perhaps gastrodynia and indigestion. If the hernia return into the abdomen, these symptoms may all vanish. Any sort of pressure may have the same effect. Obstruction or costiveness, without any fault in the bowels themselves,—costiveness from persons neglecting to relieve their bowels, or any accidental obstruction whatever,—may produce these symptoms. The presence of worms, or any injurious substances which the patient has taken, may give rise to them;—the stomach and bowels themselves being disposed to perform their functions properly, if these mechanical or accidental circumstances were not forced upon them. Occasionally, these symptoms entirely arise from the individual having taken articles, of which the stomach can make nothing,—which it cannot manage. These ingesta may be altogether improper for any one to take; or the individual may have some particular idiosyncrasy,—peculiarity of constitution (from ἰδιος, *peculiar*; συν, *with*; and κρασις, *temperament*). Some persons have a stomach, which can digest things in general very well,—without any inconvenience to them; but there may be one or two things, which their stomach cannot digest; and if these be taken there is dyspepsia, and some intestinal derangement. You can hardly say that such a person is ill; because the circumstance only occurs when he has taken some particular article of food. I once saw a maid-servant who, whenever she took any kind of fruit, experienced dreadful gastrodynia;—the pain running into the back, and causing a rapid pulse, extreme agony, and cold sweats. She could digest hard salt beef, and her general food; but if she took a strawberry or a gooseberry, she was thrown into the state I have described. Of course, an *excessive quantity* of food, will have the

same effect as improper ingesta. Nature not only intends us to eat certain things, and not others, but she also intends us to eat a certain quantity;—and therefore, just as a person may have "*diarrhœa* crapulosa," so they may have "*dyspepsia* crapulosa" (from κραιπνλα, *a surfeit*);—the stomach not being in fault, buthaving more given to it than it ought to have. You will recollect that Solomon says,—"excess of meats bringeth sickness."*

Imperfect mastication is another circumstance, likely to produce disturbance. Nature does not intend lumps of food to go into the stomach. On the contrary, she intends it to be prepared,—to pass through a certain process before it enters the great organ of digestion; and therefore imperfect masticatien will produce dyspepsia, without any fault in the part itself. Old people, when they lose their teeth, or young ones when they cannot chew as before, and cannot live on spoon-victuals, are very subject to indigestion. But,—independently of a particular *quality* of food, or a great *quantity*,—variety, or a great discordancy of meats, will occasionally produce dyspepsia.

Still speaking of causes unconnected with a fault in the stomach and intestines, we may mention "sympathy." These parts are frequently deranged through the state of other organs. In the first place, we may refer to the uterus. When the uterus is pregnant, the alimentary canal is often thrown into disorder. Nausea, vomiting, and strange longings of appetite, will sometimes occur in females, the very next morning after they are impregnated; and sometimes these will occur at the time they quicken. There is every degree of intensity of these affections. You will see them continually in

* "Be not unsatiable in any dainty thing; nor too greedy upon meats. For excess of meats bringeth sickness; and surfeiting will turn into choler. By surfeiting have many perished; but he that taketh heed prolongeth his life."—*Ecclesiasticus* XXXVII, 29–31. "Ecclesiasticus" is an apocryphal book, written in *imitation* of Solomon; and generally attributed to "Jesus, the son of Sirach." The first fifteen verses of the thirty-eighth chapter relate to sickness; and though it has no claims to inspiration, yet from its undoubted antiquity, it is very curious; on account of the notices which it gives of "the physician," and "the apothecary." Express mention is made of "medicines;" and infusions of wood are plainly pointed out. We subjoin the passage:—"Honour the physician with the honour due unto him; for the uses which you may have of him; for the Lord hath created him. For of the Most High cometh healing; and he shall receive honour of the king. The skill of the physician shall lift up his head; and in the sight of great men he shall be in great admiration. The Lord hath created medicines out of the earth; and he that is wise will not abhor them. Was not the water made sweet with wood; that the virtue thereof might be known? And he hath given men skill; that he might be honoured in his marvellous works. With such doth he heal men; and taketh away their pains. Of such doth the apothecary make a confection; and of his works there is no end; and from him is a sweet odour diffused around. My son, in thy sickness be not negligent; but pray unto the Lord, and he will make thee whole. Give a sweet savour; and a memorial of fine flour; and make a fat offering. Then give place to the physician; for the Lord hath created him. Let him not go from thee; for thou hast need of him. There is a time when, in their hands, there is great success. For they shall also pray unto the Lord;—that He would prosper that which they give for ease and remedy,—to prolong life. He that sinneth before his Maker, let him fall into the hands of the physician."

diseases of the kidney; and frequently in mesenteric disease. The passions of the mind, you know, have great effect. If a person have eaten a good dinner, and has a violent emotion of mind,—whether joy or grief, or any other,—he will most probably have a fit of indigestion. Continued depressing passions have the same effect. Many cases of indigestion that I have seen, have been referrible to an uneven state of mind. They have not depended on the stomach; but, some external circumstance has weighed down their spirits; and the stomach has suffered in consequence of it.

The cause, however, may reside in the alimentary canal itself. In the first place, there may be a real debility of the part; in the next place, there may be an inflammatory state; and thirdly, there may be organic disease. As to *debility*, that is sometimes induced by long continued excess in diet and regimen. Persons who have indulged excessively, all their lives, in eating and drinking, may expect to be subject to dyspepsia,—to have their stomach worn out; but this state frequently arises from original debility of the stomach. There can be no doubt that the stomach may be in fault;—like all other parts of the body. You will see this affection run in families, where there has been no excess whatever. You will see the father or the mother and the children labouring under this disease in various degrees;—none having committed any fault calculated to produce it. Certain portions of the stomach may be feeble; or the muscular fibres may become weak;—like muscles in other parts of the body. Some persons will have *one* muscle weak, and some *another*. There may, however, be an *inflammatory* state; and this may be either primary or secondary. It may be induced like any other inflammation; but, in most instances, it is chronic; and it is induced by constant irritation of the stomach. Sometimes it is a mere secondary effect. The stomach has been affected with weakness; till it has fallen into a state of morbid irritability, and ultimately into a state of inflammation. Sometimes, however, you have what is far worse;—*organic* disease of the stomach; and then the indigestion, and all the other symptoms which I mentioned, are irremediable. Generally it is the cardia or the pylorus which is affected; but sometimes (as you will recollect I stated) there may be an ulcer in the body of the stomach; and this ulcer may be either simple or scirrhous. Sometimes there is no ulcer; but the coats of the stomach become thickened or softened. All those circumstances that I spoke of, when treating of organic diseases of the stomach, may occur. You will recollect I mentioned, that the softening of the stomach has sometimes come on suddenly;—has appeared not to have existed above a few weeks, and sometimes not more than a day or two. You will also recollect my mentioning, that this softening was sometimes decidedly inflammatory; and that sometimes there was no mark of inflammation at all;—the parts being perfectly white.

From a consideration of all the causes producing disorder of the digestive organs, you see that occasionally it is quite independent of the stomach and alimentary canal; and you have only to remove

the unfavourable external circumstance, and all goes on right again. Sometimes you will see that the causes are of a nature independent of external circumstances, and are removable; or, if not removable, are in some measure controllable. In other instances, you will see that it is impossible to cure the affection, or even to control it much. The prognosis, therefore, must altogether depend upon what you ascertain to be the cause of the disturbance.

As to the indications in treating this affection, perhaps I may say the first thing to be done, is to alleviate urgent symptoms. Suppose that any thing injurious in its quality or in its quantity is the cause. The shortest way then will be to give an emetic, and empty the stomach; and it is much the best to give one that does not produce nausea, but an evacuation. The sulphate of zinc is as safe as any thing you can exhibit. The flour of mustard has also been exhibited, for the same purpose. But should you find that the patient is of an exceedingly full habit,—for instance, a fat, short-necked, puffy, asthmatic alderman, fifty or sixty years of age,—it may be necessary to take away blood, before you give an emetic; otherwise the exhibition of the latter may cause apoplexy. In some cases, it might be proper to premise bleeding; but in every case it is right to follow up the emetic by purging. Nothing is better than eight or ten grains of calomel, followed up by senna and salts. You thus empty the patient above and below; and he is soon relieved.

If the symptom be gastrodynia, and you cannot find any thing in the stomach that has occasioned it, then you find tincture of opium an excellent remedy. In the continued form of the disease, prussic acid will answer better; but I never saw it succeed when it was given for immediate effect. When you wish that, I think a full dose of opium is best; and laudanum will act rather more quickly than solid opium. You will sometimes find it necessary to give a large dose in this state. Twenty drops have no effect; and you have to give forty, fifty, or sixty, and to repeat the dose every half or three-quarters of an hour; for it produces none of the specific effects of opium. Occasionally, it is better to give the opium in plain, hot water, than in a tincture or brandy; because, after a violent spasm, there is sometimes inflammation. Occasionally, I have seen people labour under inflammation, after spasm has been removed;—not because they took opium, but because they took a quantity of brandy. Sometimes you must repeat a dose of laudanum, containing forty or sixty drops, two or three times, before the good effect is produced.

If the patient labouring under this disease, however, were of full habit, you would find it useful to bleed. Sometimes I have seen gastrodynia cease when the bleeding was over. Venesection is often among the best antispasmodics. After a spasm, tenderness may come on; and then bleeding at the arm, or the application of leeches, may be necessary. But the affection frequently occurs without any marks of an inflammatory state; and then laudanum is sufficient to remove it. Hot external applications are exceedingly useful. The temperature falls in this state; and it is exceedingly pleasant to the

patient to have a hot fomentation, or hot substances of various kinds applied,—not merely upon the stomach, but also to the back. I need not say that a hot-bath, if it can be procured, would be useful. This state is often called "the passage of a gall-stone;"—for no reason whatever, but that it comes on suddenly. You are never justified in saying, that an individual is passing gall-stones, unless he has passed them before, and they have been really found; because a pain of this description may come on in a moment, from eating an article which does not suit that particular individual; or an external circumstance may occasion it; and there is no difference, as regards pain, between it and the passage of a gall-stone.

Suppose the urgent symptoms that require to be removed are heartburn, acidity, and a scalding sensation in the stomach, rising to the throat, I need not say that magnesia, the carbonate of soda, and things of that description, are the best. They will remedy this state chemically in a moment, without a reference to the disease itself. In the healthy stomach, there is muriatic acid. As soon as food is taken, muriatic acid is formed; and, in some persons, it is generated in such great abundance, that it produces this affection. If there be very fœtid eructations, from something putrifying in the stomach, and if the latter be overloaded,—distended with them, it is best to give an emetic. If there be no reason for giving an emetic, two or three drachms of the common solution of the chlorurets might be given; and common acids, also, will answer very well. These, however, are means to be resorted to only when there are symptoms particularly urgent that require removal. We have more to do in order to cure the disease; and we must lay down for the patient a system, for the regulation of his habits and employments.

Having spoken of what ought to be done, in the way of lessening any very urgent symptoms that may arise in disorders of the digestive organs,—particularly in a violent attack of gastrodynia,—we will now consider what is to be done for the cure of the disease;—what is to be done in the way of a regular plan for the termination, or alleviation, of the complaint. In the first place, we must ascertain the cause of the disease; and if it be external to the stomach, we must proceed accordingly. In females, this disorder very frequently arises from the state of the uterus. In pregnancy, it is very common for the stomach to fall into such a state of disorder, that the patient's life, for a time, is rendered miserable; and occasionally, from the constant vomiting,—from the inability to retain any food whatever on the stomach, life has really been brought into danger. In very extreme cases, it has been judged right even to induce premature labour, for the purpose of putting a stop to this great disorder. In ordinary cases, however, although we cannot cure the nausea and vomiting, much may generally be done to alleviate them;—not by removing the pregnancy of the womb, but by lessening the irritability of the stomach, so as to make it sympathize with the uterus as little as possible. Simple bleeding at the arm, has frequently been sufficient for this purpose; and so has the frequent application

of leeches to the epigastrium. All those medicines which I shall hereafter mention, when speaking of another head of treatment, as calculated to lessen the morbid irritability of the stomach, will here be proper;—such as strychnine, conium, and prussic acid. It is also proper that the patient should take but a small quantity of food at a time. But I will speak more particularly of this presently.

If we can ascertain that the disease (as is not uncommon) proceeds from a hernia, the application of the taxis may be the only means of curing the dyspepsia. If you discover that there are worms, the remedies necessary to destroy them will be proper. These remedies I will consider hereafter.

Very frequently, the stomach is not in fault; but there is a sluggishness of the intestines; and as the cause is situated there, a regular course of purgative medicine will be found absolutely necessary. It is wrong to give *strong* purgatives. Those which open the bowels regularly, are best adapted for the purpose. It is astonishing how long things, which are taken into the stomach and intestines, will remain quiet; and then give rise to various symptoms. I believe I alluded to the circumstance before. In the "Philadelphia Journal," for 1822, there is an account of a coagulum of milk, which was vomited two months after it had been taken. I have myself seen a coagulum of milk, like bird-lime; which had remained some days (even a week) in the patient's stomach, and produced the greatest uneasiness,—the stomach not being in fault, but being oppressed by this particular substance. I believe I mentioned that Dr. Barlow, of Bath, published, a case not long ago; in which pills of sulphate of iron were discharged *per anum*, a year after they had been taken. I have seen a piece of salmon vomited by an infant, a month after the nurse had been so foolish as to give the child that food. In a foreign journal, a case is mentioned, similar to that of Dr. Barlow's;—a case in which pills were vomited, a year after they were taken. An instance is recorded, in which a blacksmith's son bolted thirty grapes. He did not *masticate*, but swallowed them *whole*; and, after three months' frequent vomiting and extreme suffering, he was cured by an active purgative medicine. Ten of the grapes came away whole, even then. You will find a case mentioned by Bartholini, where a coagulum of milk, as large as a man's tongue, was discharged after the patient had taken muriatic acid. The same author also mentions a case, where a patient had swallowed a swine's tooth. He suffered under hypochondriasis and extreme emaciation, for two years; the tooth was then discharged *per anum*; and the individual perfectly recovered. You therefore see that, occasionally, you may have disorder of the digestive organs from articles which have been taken, and have remained in the stomach and intestines a much longer time than you could imagine. If, in a case of disorder of the digestive organs, you suspect any thing of this kind, you ought to employ strong remedies. Purgatives and injections, of course, are very important. But whether this be the cause of the disease or not, you will find it of the highest importance to keep the bowels

regular. Nothing can be worse than to give strong purgatives for this purpose; except where there is something considerable to be brought away. In a case of habitual costiveness, strong purgatives, are decidedly bad; because, when you have once acted violently on the intestines, the latter, according to the laws of nature, must fall into a torpid state,—go to sleep. During this condition of repose, the fæces accumulate again; so that you have to give another strong dose, in order to remedy the mischief of the first. Thus the person is always costive or taking strong medicines; the consequence of which is, that he is at last obliged to take them, or he will fall into a state of dyspepsia. One of the best remedies for this state, is a very minute quantity of croton oil (about the twelfth, the sixth, the fourth, or the third of a drop), given regularly with rhubarb or colocynth; and if it should gripe, a small quantity of some aromatic oil may be added to it. You may order one, two, or three drops to be made up into pills; and make the patient take one every night. You will soon find that it will produce one copious stool in the morning; and you also find that the medicine may be taken for two or three years, perhaps for ever, without losing its effect. The patient will not be under the necessity of increasing the dose. If, however, you give it violently, the patient will be in the same condition as if he had taken other purgatives;—he will be costive afterwards. Nothing can be more absurd than to give blue pill, calomel, and mercurial medicines; because they have a two-fold operation. They not merely act as cathartics, but they also pervade the whole system; and thus make the patient weak and nervous. These medicines do more than you want. You merely require the intestines to be acted upon; and not the intestines at large to be put under the specific action of mercury. If Mr. Abernethy had lived a hundred years, and done good all the time, he would not have atoned for the mischief he has done, by making people take blue pill. Half the people in England have been led to fancy, that they cannot live without blue pill; which not only does no more good than any other purgative, but likewise renders those who take it constantly susceptible to cold; and must altogether be very injurious.

I may here mention, that there are some persons who have naturally very torpid bowels;—to whom it is not natural to have a motion every day. I presume that, in ninety-nine cases out of a hundred, it is natural for the bowels to be emptied once in the twenty-four hours; but there are some who do not have a motion oftener than once in three or four days; and they are ill if they do. I have met with such cases. Dr. Heberden knew a person who, all his life, had but one motion a month. As a contrast to this, Dr. Heberden mentions another individual, who had twelve motions a day, for thirty years. That must have been a very troublesome state of things;—a kind of "perpetual motion." This same individual had, after this period, a motion seven times a day, for seven years. Women are much more costive, and suffer this with more impunity, than men; on account of the pelvis being large, and the rectum dis-

tending. Nothing is more common than for women to tell you, that they have been a week, or ten days, without a motion. You must therefore take into account, that it may be natural for some individuals to have a motion only every few days.

In a case of disorder of the digestive organs, you should always examine into the state of other parts of the body; for this condition will take place, from sympathy, not only with the uterus, but with other organs. A very common cause of this disease, is disorder of the brain;—what is commonly called "disorder of the *mind*." From anxiety, grief, and distress of mind, many persons have complaints of the stomach. So far as the stomach itself is concerned, they have no reason to find fault; but from the state of the mind, the stomach cannot do its duty. Excessive anxiety, or grief, will not only take away the appetite, but will produce constant imperfection in the functions of the stomach; together with all those symptoms of indigestion, and derangement of the digestive organs, which I formerly mentioned. I have very frequently been unable to do any material good, because the complaint evidently depended upon the state of the mind; and very frequently I have gained credit where I deserved none, simply from the circumstance of the unhappy state of mind ceasing. I have very frequently attended young ladies, who could not digest;—who had flatulence of the stomach; *no* appetite or *great* appetite; every thing wrong;—simply because there was an anxiety respecting love-affairs. They were in fear of disappointment; and as soon as the affair was settled, they ate, drank, and digested like other people;—without any inconvenience; but, on the contrary, with great benefit. I have frequently been baffled in what appeared good rational treatment, because there was some grief of mind, or some constant anxiety.

It is always right to look out for any particular habit;—to see whether the patient is in the habit of doing any thing, to which you can attribute the disease. Dr. Cullen mentions two cases of dyspepsia, from patients taking snuff before dinner. In one of these two cases, the disorder of the stomach was gastrodynia,—aching pain of the stomach; and in the other case, there was a complete loss of appetite. Now both these individuals, on being particular not to take snuff before dinner,—taking as much as they chose when the stomach had something in it, recovered from their dyspepsia. The one lost his gastrodynia entirely; and the other recovered his appetite. With regard to myself and tobacco, if I smoke three cigars in a day, or smoke three or four successive days, I invariably have dyspepsia. Although I have the best stomach in the world,—one that will digest any thing in the shape of proper, good, nourishing food, yet if I smoke in that way, it invariably produces the most extreme gastrodynia and cardialgia,—so as to make me quite miserable; and therefore I am compelled to be temperate in that respect. You will find that many persons have this disease, from going too long without food. Habit has a great deal to do here. Some persons who breakfast at nine in the morning, and dine at

seven in the evening,—taking nothing in the meantime, feel no inconvenience; and others suffer the *greatest* inconvenience, if they fast more than four or five hours. You will find that habit will not operate on some people, with regard to this point;—that some persons cannot be brought to fast long; and it is vain for them to attempt it. They feel a sinking in the stomach;—they have gastrodynia induced, if they do not eat frequently. Some cannot pass above four hours without food; and in proportion to the labour undergone, is the necessity of eating. In making inquiry into dyspeptic cases, therefore, you should ascertain how frequently the patients eat; but you should also ascertain whether they eat too much; for the stomach must not be blamed, because it does not do double or treble the duty that nature intended. It is said that, in the reign of Henry the Sixth, the people ate but twice a day; "whereas," says Hollinshed, "we have breakfast in the ferenoon, breakfast after dinner, and rare suppers when it is time to go to rest. Now these additional repasts are very well left out; and each one should content himself with dinner and supper only." Another point is to ascertain whether the patient masticates his food. Many persons gobble up their dinner, as a hog would do, instead of masticating it properly. Another point is to ascertain what is the person's diet, and to regulate it for him. You know that some nations live on fish; others on putrid animal matter; and others on vegetables. An eagle has been brought to eat bread, and a pigion to eat meat;—the former being a bird of *prey*, and the latter a *domestic* bird. John Hunter brought a hawk to live on bread. If these changes be accomplished slowly, they may be well borne; but many cases of indigestion arise from persons suddenly changing their diet. It is mentioned that our countrymen who were prisoners under Tippoo Saib, were fed during their confinement upon nothing but rice, water, and capsicums; and on their return, when they were liberated, they of course ate as before. The effect of the suddenness of the change, even to their former diet of meat, was such, that violent diarrhœa was induced. Very frequently you find persons suffer, in this respect, from a change of food; and even from a change of place;—from having different bread from what they have been accustomed to, and different water from that which they formerly had. We see the effect of habit, every day; for the lower orders, without appearing to suffer from it, will eat such butcher's meat, and such fish, as would disorder the stomach of their superiors.

There can be no doubt that, generally speaking, food is best composed of a mixture of vegetable and animal substances. It appears from the teeth, and likewise from the experiments made with the solvent juice of the stomach, that digestion is most likely to take place with facility, and in perfection, if the diet consist of a portion of animal and vegetable substances. In general, too, the food is much better digested, if a certain degree of art be applied in its preparation, — the art of cookery. Some persons, with weak stomachs, require this art in full perfection. They do not digest

things, unless they are thoroughly boiled,—thoroughly pervaded by heat,—either *dry* heat, or heat and *moisture*; and even then they require the addition of good spices. With regard to patients labouring under this affection, therefore, it is necessary to ascertain whether they have made any change,—whether the meat they eat is good of the kind;—to ascertain, also, whether they eat a proper proportion of animal and vegetable food; and to ascertain that they do not eat things raw, which might be dressed. Many persons for example, have indigestion only when they eat articles not thoroughly cooked; and some persons digest every thing, except raw vegetables, salad, and radishes.

In general, brown and old flesh is better digested than young meat. Mutton is easier of digestion, for example, than veal; and capon than a young chicken. In general, meat that is not particularly fat, is better digested than when it is; and lean is better digested than fat itself. Fresh meat, too, is usually better digested than salt meat. Salt hardens the fibre, makes it more compact, and less easy of solution. Dr. Robinson addicted himself to taking a vomit every evening; and he found that he brought up veal undigested; but when he dined on beef, very little remained;—shewing that the latter is of more easy digestion than the former;—*old* flesh than *young*. With regard to *fat*, it is a curious circumstance that some persons who can digest but few things well, can digest a piece of broiled bacon thoroughly; and it is now the fashion to take broiled bacon, as a thing very easy of digestion. Mr. Cunningham, a surgeon, who wrote an account of New South Wales, states that he knew a person, in whom the smallest portion of the fat of beef or mutton deranged the stomach; and she was forced, before she could take gravy, to allow it to get cold, and then have it skimmed, and warmed again;—so that not a particle of fat remained in it. Yet she could eat broiled fat bacon with impunity.

Another point to be attended to is, not to take much liquid food into the stomach;—not to indulge in broths and slops; which are so much animal matter, with water into the bargain. It is better to take animal food in a compact form, than in a quantity of hot water; because, no doubt, this quantity of liquid is injurious to the stomach. It dilutes the gastric juice; and (we must suppose) relaxes the stomach. It must both sodden it, and diminish its powers. Were there no other reason than that which I have just assigned, it would be wrong to drink too much liquid of any sort, even beer, and tea. One of the best things to drink after dinner, is a cup of very strong coffee, without any milk. Some persons, however, are so stimulated by this, that they cannot bear it. But, in general, it is a good rule for dyspeptic people to limit their quantity of drink as much as possible; to take no slops or broth; and, in preference to drinking beer or water, to take a cup of strong coffee. With regard to vegetables, waxy potatoes are seldom well digested; and it is necessary that greens should be thoroughly boiled;—that is to say, boiled in a large quantity of water, and boiled very vigorously.

You will find many persons much better without beer or wine; but some have a stomach so languid, that it requires the stimulus of wine. You cannot prescribe any particular wine. For some persons, Port is best; for others, Sherry; and for others, again, Madeira. With some people, Port turns acid, and with others Sherry; but, in a great number of cases, you find that Sherry agrees best with the stomach. A mixture of wine is bad; and persons will frequently bear Port, Sherry, or Madeira alone, when they would be made ill by taking any two of them together. But some add beer to a mixture of wines; and then you may expect a treble commotion in the stomach. Some say, that if they take a glass of brandy, it settles all;—it is like oil poured on the sea in a swell. But you find that many persons have stomachs so susceptible, that no wine can be drunk; and, indeed, nothing but brandy-and-water can he borne. As to Champagne, Burgundy, and home-made wines, they are sweet; and generally disagree with the stomach. Still you will meet with exceptions; and you will find cases where vomiting is stopped by Champagne. All Rhenish wines are sour, and likewise Claret; and these usually ferment in the stomach, and become acid; and therefore they are improper. Generally one wine only should be taken; and that which usually answers best is Sherry.

It is well to prevent persons labouring under this complaint from eating suppers; unless they have had an early dinner. If people dine at one or two o'clock, it is necessary for them to take something in the evening. Now and then, you will meet with persons who are not so well without a good supper. They will lie awake from irritability brought on by exhaustion, unless they eat suppers; and therefore there is no rule for these things. There are general rules,—such as I have now mentioned; but you must never stand up for them universally. You must make exceptions; and adopt what you find the patient's constitution requires.

You will find it very proper to advise some persons to eat brown bread, instead of white. Many persons will not be costive, if they eat brown bread; but, in others, it produces a degree of heartburn, and acidity. It is almost always right to advise persons to remain quiet after dinner; for if there be much moving about, digestion does not go on so well. It is a common saying,—

"After dinner sit awhile!"

and it is also said,—

"After supper ride a mile!"

This is not to digest the supper; but because the person should eat so light a supper, that he may ride a mile afterwards, without doing himself any injury.

You thus perceive that much may be done, in the way of curing disease of the digestive organs, without any medicine at all;—simply by discovering the cause, and removing it; and this cause is very frequently some bad habit. It is absurd, in every case of affection

of the stomach, immediately to order something. You should sit down, and learn the history of the case;—ascertain if the cause is beyond the stomach; if it has its seat in any other organ; what is the state of the intestines; what is the condition of the mind; whether the patient has been fasting too long, or eating too much, or taking something that disagrees with him. If it arise from any of these causes, you may cure the disease without any medicine;—may put the patient in possession of a plan, which will put a stop to his ailments. I am quite sure that, in the greater number of cases of indigestion, the disturbance arises from things forced into the stomach, from the state of the mind, or from some injurious habit which the patient has contracted; but it is necessary to attend to all the points I have mentioned, with regard to diet; for some persons have such weak stomachs, that they require a particular line of conduct. Articles which produce indigestion in some people, will not give rise to it in others.

We may perhaps, however, have to treat disease of the stomach itself. Independently of all external circumstances,—of things external to the stomach, the stomach itself may be in fault. Having cleared the way so far, we should look out for inflammation,—ascertain if there be gastritis. If you find a great sensation of heat in the stomach, and up the throat, and if you find the part tender on pressure, you must treat the case as you would any other inflammation. Leeches frequently applied to the pit of the stomach, moderate purging, and mild diet, are the suitable means. If we find no such marks of inflammation;—if the stomach suffers pain when food is taken, although there is no pain on pressure; or if the stomach vomits,—discharges its contents, and yet there is no pain or heat;—we may conclude that the case is one of morbid irritability; and for the purpose of lessening this, you will find that prussic acid is one of the best remedies. In gastrodynia, it answers exceedingly well. If there be inflammation united with this spasmodic pain, you must remedy that by leeches; but if there be merely spasmodic pain, or a constant aching at the stomach, you will often find prussic acid answer very well. It is best to begin with one minim three times a day;—taking care not to give it on an empty stomach; for a dose that will be borne very well when the stomach is *full*, cannot be borne when it is *empty*. All agents affect the stomach most when it is empty;—when they come in contact with it;—when they are not mixed with its contents, and consequently not diluted, and only applied partially to the organ. If you give some doses before meals, and others after it, it will not produce a uniformity of effect. It is best to equalize the dose, by giving it after meals. You may begin with a minim; and, in a day or two, increase it to two minims, then to three, and so on. The symptoms of an unpleasant kind which it produces, and which are sufficient to make you limit the dose, are sickness, faintness, convulsions, and a little pain in the head. You must tell the patient of these things, and guard him against their occurrence;—desiring him, if they take place, to diminish his dose

of medicine immediately;—not to take so large a quantity again, but a smaller dose. Then, as to the dose, there is no rule whatever. I believe I mentioned having had a patient, who could not bear more than the fourteenth or seventeenth of a drop without uneasiness; and I had another who said he took seventeen minims, three times a day; but he could not get beyond that. I have several times seen patients, who took eight or nine minims three times a day; and even that is a large quantity. The dose that is usually borne, varies from two to four minims.

Hyoscyamus, conium, and strychnine, are given for the same purpose; but stramonium and opium, I think, are better than any of these. I think stramonium is the best; because opium confines the bowels; and that is injurious in these cases. I have seen stramonium cure this pain in the stomach (gastrodynia). There is no rule for the dose of this medicine; but it is well to begin with half a grain, two or three times a day; and gradually to increase it, while there are no unpleasant effects. These effects are pain of the head, convulsions, and giddiness; and if the remedy be given incautiously after these begin, you may have drowsiness, violent pain, violent throbbing of the temporal and carotid arteries, and sometimes thirst, and great dimness of sight. If the two latter symptoms are not considerable, the patient may bear them; but if convulsions, giddiness, and pain of the head be induced, it is well to omit the remedy immediately; and then to give a smaller quantity.

Next to stramonium, conium answers very well; but very frequently it requires to be given in increased doses,—up to ten, fifteen, or twenty grains, three times a day. Opium is also proper in these cases, if the patient's bowels are relaxed, and you are anxious for the medicine to have a double effect. With regard to the feeling of morbid irritability, that is much better put a stop to by prussic acid, than by stramonium. I have frequently seen it stopped by the first or second dose; but I think that the gastrodynia,—the aching of the stomach, is best relieved by stramonium. Prussic acid answers very well; but I have seen it fail, where stramonium cured the case with facility. The subnitrate of bismuth* has been used to lessen gastrodynia; and, no doubt, with good effect. The Unguentum Antimonii Tartarizati† has also been employed. It is well, in these cases, to give but a small quantity of food at a time; for the stomach, when much distended, falls at length into a spasmodic state. The more distended the stomach is, the greater effort does it make to contract, and the greater is the spasm; and therefore a small quantity of food is proper.

As to the symptoms of morbid irritability of the stomach, you have carefully to remember, that it may be united with gastrodynia; and you must remember that the morbid irritability may, at different times, amount to inflammation; so that the remedies which, in the

* Now the *Bismuthi Trisnitras.*

† Admitted into the "London Pharmacopœia" of 1836, under the title of *Unguentum Antimonii Potassio-Tartratis.*

first place, were calculated to relieve it, will no longer do so; and the remedies for inflammation must be employed. You are never certain, from day to day, whether the symptoms depend upon inflammation or morbid irritability. Occasionally you have to apply leeches, and the remedies proper for inflammation; at other times, those that I have now mentioned; and frequently you have to employ both; for there may be a degree of tenderness;—but more *pain* than *tenderness*;—so as to render both plans proper. Frequently prussic acid and conium are improper;—the remedies for inflammation being required. In other cases, the remedies for inflammation are improper;—the patient requiring narcotics; and, again, you have other cases, where *both* plans are proper.

You may have another condition of the stomach;—where there is no gastritis,—no inflammation,—no morbid irritability independent of inflammation; but where the stomach is *torpid*. You will have some patients with what is called "a *cold* stomach. They can digest their food, if they take brandy and cayenne pepper. Now in indolence of the stomach, aromatics are generally good;—mustard and cayenne pepper; and, with regard to medicines, ether, camphor, fetid substances, and ammonia, will be found useful. Dr. Baillie says that where, in disorder of the stomach, a quantity of viscid mucus is discharged, the compound tincture of benzoin is an excellent remedy; but where there is pain on pressure, I would not give such a stimulating medicine.

In disorders of the stomach, it would be absurd always to tell patients to abstain from wine, and to take nothing rich; for you find some persons who digest better if they take a few spiced articles, and a few glasses of wine,—perhaps even a pint. Some must have wine, and even spirits. In some cases of this description, the application of galvanism to the epigastrium has been found very serviceable. In this weakness and torpidity of the bowels, tonics, of various kinds, are useful;—especially iron; and particularly Ferrum Ammoniatum,* which is one of the most stimulating preparations of iron. Bitters are useful; and to these, people often add soda; which is a good stimulant. Acids, as well as tonics, have been found useful; and they are often the best remedy for acidity: for they destroy that state of the stomach which gives rise to it. Nothing can be worse, in these cases, than for people to vomit and purge themselves, as they frequently do. It must weaken the alimentary canal. It is right to enjoy plenty of fresh air. Patients ought to avoid confinement. They should have exercise short of fatigue; and should have a pleasureable occupation. It should be constant occupation without care.

WORMS.

It has been said that nature has provided every animal with other animals to prey upon it;—to make a habitation of it, and derive food from it. It is even said that a flea has its flea; and if so, I

* Now the *Ferri Ammonio-Chloridum.*

suppose, the latter would have its flea's flea. How far this matter goes, it is impossible for me to say. Some of these animals evidently come from without, and perhaps exist but temporarily; and these are called "*ectozoa*" (from ξωα, *animals*; and εκτος, *without*, or *outside*); whereas those that colonize, establish themselves, breed a posterity, and become whole families at last, are termed *en*tozoa, (from ξωα, *animals*; and εντος, *within*).

As instances of the *ectozoa* (those which reside upon the skin) I may mention fleas, lice, bugs, and other delicate little animals. But we have also others which reside *within*; some getting into the anus, some into the maxillary sinuses, some into the stomach and intestines, some into the biliary ducts, and some into the cellular membrane beneath the skin. I had a patient (an infant) who discharged about a dozen larvæ (maggots) of the common fly, all alive. The child had suffered from a chronic cough; but as soon as these dozen larvæ were discharged from the intestines, it lost its cough. I saw them myself in the napkin,—moving about in the fæces;—exactly as you might have seen them, if they had never been in the body. I understood that it had eaten part of a high pheasant, some months before. I have had two cases, in which a live caterpillar was discharged from the intestines. One of these cases occurred in a woman, who was in the habit of eating cabbage-stalks, when she washed them for dinner. The moth lays its eggs on cabbage stalks; and no doubt this patient had swallowed some of the eggs; and it so happened that one of them was hatched. Dr. Good, in his work on Medicine, gives an instance of a flesh-fly (the *musca cibaria*), or rather the larva of it, being discharged by means of purgatives, after producing considerable derangement. The larva of the bee, and even live spiders, have been discharged downwards, from the alimentary canal, by human beings. Even the *triton palustris* and the *lacerta aquatica* (the *domestic* and the *horse*-leech) have been discharged by vomiting, and have been found in the stomach. Leeches, when they get into the stomach, will sometimes (from sucking the blood) attain so large a size as scarcely to be recognized. When soldiers have been encamped on marshy ground, it has been found dangerous for them to go to sleep; lest leeches should get into their mouths, and destroy them. Life has been lost from leeches crawling down the œsophagus into the stomach, sucking blood there, and producing fatal hæmorrhage. I once saw two centipedes, said to have been vomited by a girl twelve years of age. There was no reason to suppose that any deception was practised. She vomited them; and the vomiting was attended by a tightness in the throat. The animals had lived three days when I saw them. The mother said, two months previously, the girl had vomited a black-beetle. She had palpitation of the heart, pain, and heaviness of the head. Dr. Duncan, in the ninth volume of his "Medical Commentaries," mentions the case of a boy, who discharged four caterpillars after a dose of calomel. It is said that several crawled out at the anus afterwards; and on exhibiting calomel and jalap, an incredible number came away. I

should not have paid much attention to these accounts, if I had not myself witnessed similar effects. The boy mentioned by Dr. Duncan, likewise discharged a lumbricus. I have no doubt that some persons are the sport of these insects; while in other persons they would die. It was ascertained, in Dr. Duncan's case, that the boy had frequently gone into the garden, and eaten a young cabbage-leaf;—just as I ascertained that the woman ate the stalks of cabbage, when preparing the latter for dinner. In "Hufeland's Journal," for 1822, there is an instance of live and dead slugs being discharged by vomiting and purging. I recollect a case mentioned in the "Medical Gazette," by Dr. Alderson, of Hull, of a centipes being discharged from the stomach;—exactly as occurred in the case that I saw. You know that horses have what are called *bots* in the stomach, if they swallow the eggs of the common gad-fly. The gad-fly, at a certain period of the year, lays its eggs upon their coat; they lick their coat, and swallow the eggs, which attach themselves to the splenic portion of the stomach. I suppose all this is natural; for I believe they are often found in the stomach of horses. Nature appears to have destined this place for their reception. When they are mature, they escape through the intestines, and become gad-flies. Those animals which evidently come from without, are all called "ectozoa."

You will hear numerous instances of severe headaches having arisen from insects getting into the nostrils, and crawling into the frontal sinuses; and also from their getting into the meatus auditorius. Nothing is more tormenting, I understand, than "a flea in the ear." If it get into the ear, it buzzes about, and makes as much disturbance as a giant would; but this state may be cured in a moment. I recollect the case of a patient of my own, who had been in the greatest agony from this circumstance; but on pouring a teaspoonful of oil into the ear, the flea was quiet in a moment. I suppose it was suffocated. There is a kind of gad-fly which settles in the rectum; and it is therefore called *œstrus hæmorrhoidalus*. It has been found to make its way even into the womb. There is one kind called *œstrus ovis*;—from its always selecting sheep. The guinea-worm comes from without, perforates the skin, lies for a considerable period in the cellular membrane under the skin, and is the source of very troublesome ulcers.

As to those animals which settle regularly in the human body, colonize, and descend from one generation of human beings to another, they are found both in cavities and in the substance of the body; and each of these "entozoa" has its particular habitation. The one called *lumbricus*, always occupies the intestines or stomach; the one called *strongyle*, particularly fixes on the uterine organs; the one called *fluke*, is found in the liver; and the *filaria*, or *guinea-worm*, is found in the cellular membrane. There are three principal forms of these animals, found in the living body. Those of one set are *round*,—in cylinders or spindles; those of another set are *flattened*, like bobbin; and those of the third set are *globular* or *vesicular*. It is the latter that are chiefly found in the substance of organs.

Linnæus arranged them according to their *situation*;—accordingly as they were found in the intestines, or in other viscera. Rudolphi (the naturalist) of Berlin, names them from their form; and arranges them into five classes. The first of these he terms *Nematoidea* (from *νημα, a thread*; and *ειδος, form*). He has a *second* class, which he calls *Acanthocephala* (from *ακανθα, a prickle*; and *κεφαλη, the head*). These are animals which are of the hydatid-kind. They have no spinal canal; but have distinct genital organs. There are two sexes; and they are found only, or chiefly, in the intestines of swine. Then he has a *third* class; which is called *Trematoda* (from *τρημα, an aperture*; and *ειδος, form*). These are flat, with minute pores. It is said that these have no intestinal canal; but distinct genital organs. Then the *fourth* is *Cestoidea*, (from *κεστος, a girdle*; and *ειδος, form*); which include the different kinds of the *tænia*, or "flat worm;" and the fifth he calls *Cystica* (from *κυστις, a bladder*; and *ειδος, form*). These are *hyatids.**

Cuvier makes more simple classes than these. He arranges, in separate classes, those which have a distinct digestive cavity, and those which have *no* distinct digestive cavity to be traced in the interior. Those of the first are called *Cavitaires*; because they have a digestive cavity;—its regular canals and an anus; and those of the other are called *Parenchymateux*; because they have nothing but a uniform structure, with no regular digestive tubes. This last class embraces all the classes of Rudolphi except the first; and those which have a regular digestive apparatus comprehend the round worm, the little ascarides, the strongyle, and the guinea-worm; and therefore, instead of the *five* kinds of Rudolphi, Cuvier makes but *four*.

I will now begin with the *Cavitaires*; or, according to Rudolphi, the *Nematoidea*. The first of these was formerly termed *Lumbricus*; but it is now termed *Ascaris Lumbricoides*. This worm has external integuments. It has also muscles, a *digestive* apparatus, and a *genital* apparatus; and some have thought that it has a circulating and a nervous system. The muscles of this worm lie immediately under the skin. The fibres are two-fold;—both long and transverse. The digestive organs are quite straight. It has a triangular mouth, with three tubercles; the anus is at the opposite end; and the genitals fill a great part of the animal. Each sex is a different individual; and the opening of the genitals is near the anus. You will find it from twelve to fifteen inches in length; it is of a yellow colour; and as many as eighty of them have been discharged from one individual. The celebrated Professor Frank mentions a case, in which the intestines were absolutely crammed with them. This worm is usually found in the small intestines. Occasionally it is found in the *large* ones, in the stomach, the œsophagus, the pharynx, and the mouth;—for I have known a person vomit one; but its proper habitation appears to be the small intestines. Andral says that he found a lumbricus in the pharynx. It got out of the small intestines into the

* Dr. Fletcher's very useful table of these Worms, will be found at page 195.

stomach; from the stomach into the pharynx; and then one end turned down into the larynx, and there caused sudden death by suffocating the patient. Andral also saw several in the liver; having apparently crept up the ductus communis choledochus to the duodenum. Dr. Baron, of Gloucester, mentions having seen a lumbricus in the ducts of the liver; and an old physician, who wrote on Morbid Anatomy, mentions having seen several worms in that situation. Andral says that he saw a liver absolutely perforated with them; and sometimes they have perforated the intestines, and got into the peritoneum. They have sometimes been known to escape externally through the integuments; or into the urinary bladder, or into the vagina. You will observe the resemblance of this animal to the earth-worm; but the earth-worm is found to be less pointed; its mouth is only a small slit at the under part of a rounded head; and the anus is not *near* the extremity, but at the *very* extremity. The earth-worm is more fleshy, and more marked with rugæ; and it has one most distinguishing circumstance,—a quadrangular row of processes, like feet; which it can erect and move about. It has also three longitudinal lines at the upper surface; and it is an hermaphrodite. The Ascaris Lumbricoides is by far most common in children; and is rarer as people grow old.

The next worm, in point of size, is that formerly called *Trichuris* (from θριξ, *a hair*; and ουρα, *the tail*); sometimes improperly termed "the *three*-tailed worm." Unluckily our predecessors mistook the *head* for the *tail*, and it is now called *Trichocephalus* (from θριξ, *a hair*; and κεφαλη, *the head*). It is a very small worm;—about one inch and a half, or two inches, in length. It is of a violet colour; and the anterior end is much finer than the posterior;—it becomes a mere point for the mouth. The posterior end of the male is bent; and it has a straight alimentary canal, around which are placed the organs of generation. This worm is found lower down in the alimentary canal than the last; for it occurs chiefly in the cæcum. There are generally several of them. It is much more common in infants, than in others.

Another worm which has also an alimentary canal, is the *Ascaris* (from ασκεω, *to move about*); or, properly speaking, the *Oxyuris* (from οξυς, *sharp*; and ουρα, *tail*), or "drop-tail." This passes with the common people, under the name of "thread-worm." It lives as low down as it possibly can in the rectum, and frequently makes its exit; and when it once gets out, it cannot get back, but shrinks up and perishes. It is far shorter than the others. The male is said to be about a line and a half in length; the female four lines. The organization is the same as in the other two kinds. It is not only usually found in the rectum; but it is generally surrounded by mucus. These worms will crawl out; and patients sometimes amuse themselves by seeing how many they can catch during the night;—in order that they may shew their exploits to the doctor, in the morning. I have known them to crawl out of old persons; so that they have complained that they picked them off their thighs in bed.

Worms of the other description (called *Parenchymateux* by Cuvier) have no digestive or other perceptible organs, except instruments of locomotion. They have various forms; some are *spheroidal*, some *flat*, and some *long*. They are the *Acanthocephala*,—with twopoints the *Trematoda*,—with a perforation; and the *Cestoidea*, including those of which I am now going to speak,—*Tæniæ*. These are found in the substance of the body, and in various cavities. Lastly, there are those which are called *Hydatids* (*Cystica*), and which are very frequently found in the substance of the body, but occasionally in its cavities; and sometimes they have a particular cyst.

I will now proceed to that worm, which we meet with every day in the living subject; and which is called *Tænia* (from *ταινια*, *a fillet*). This animal is never less than several feet in length; and sometimes many yards. One author mentions a worm of this kind which measured one hundred and fifty feet; and another foreign writer saw one three hundred feet long. Though I never saw one so long as that, yet I have frequently seen seven, eight, or ten yards, come away at once. It is fine in structure, and has a series of articulations,—each with natural pores. Dr. Baillie says, that the last joint has an aperture. The anterior part of the worm is very fine; the head is square; and it has little retractile hooks. There is no regular organization within;—that is to say, there is nothing leading to a digestive tube. It is almost a mere amorphous mass; yet you may feel arborescent vessels about the joints; and a serpentine canal is sometimes seen at the edges. It moves in an undulatory manner. There are two kinds seen;—the one called "Tænia *Solium*" (from "solus," *alone*; because it usually infests the body singly); and the other "Tænia *Lata*" (from "latus," *broad*). That which is called *Tænia Solium* is, towards the head, about the third of a line broad; and has crotchets before and on each side the articulations. On this account, it is sometimes called "armed" *Tænia*. The other, which is called *Tænia Lata*, is shorter and broader; and has no crochets. The latter usually exists in cavities,—three or four in an individual; and from twelve to fifteen feet long. The "Tape-Worm" is far more frequent in adults, than in children, and in the dog than in the human subject; but it is said that in the dog, and in other brutes, it differs somewhat from that observed in the human subject. It is more common in some countries, than in others. In Switzerland, the water is very bad; and the *Tænia Solium* is very common there. The *Tænia Lata* is not so common.

It is probable that a great number of those worms which I have now been speaking of as *entozoa*, really came originally from without. Many persons, on going to particular places, have presently become subject to worms;—just like other people in that particular neighbourhood. Persons who, by accident, have drunk bad water, have frequently had worms from that time. There can be no doubt that Tænia may be continually traced to external sources; and with respect to Ascarides, you will see a remarkable case published in the "Dublin Transactions," Volume II;—a case in which a whole family

was infested with this worm; and every servant who came to the house, after a certain time, had it. Although medicines were taken, yet nothing liberated these persons from it; and at last ascarides (very similar, but a little browner) were discovered in a well, from which the people derived all their water. The family had resided there many years, but they now found it necessary to change their habitation; and, from that time, nearly all of them lost their worms. The race was kept up in one individual; but the greater part of the family lost the worms on ceasing to drink that water. With regard to Tænia, Dr. Darwin mentions that the fens of Lincolnshire are famed for them. Sir John Pringle says, that the Lumbrici are very common in the remittent fevers of marshy countries; and that when they have been once introduced, it is impossible to say how long they may remain. They may continue for many years. It appears to be a fact, that they may be transmitted from generation to generation. A German writer of authority says, that he actually found worms in the intestines of a fœtus. This is not at all surprising; for the germs may be easily transmitted from the mother to the offspring. Lamarck, the French naturalist, has found the same thing. Tænia have been seen in a muddy spring; only they were rather smaller than those observed in human beings. You know that the lower animals are easily altered by particular circumstances; and therefore it is not surprising that ascarides should be of a different colour and size *in* the body, and *out* of it;—in wells and in the living subject. I recollect being told by a friend, who had travelled a great deal in Syria, that he drank some bad water, and was exceedingly ill, for a week or so. He did not know what was the matter with him; when, all at once, after taking a good dose of calomel, he discharged little more than a heap of small maggots. What they were, he was not naturalist enough to inform me; but he got well; and his illness could be traced to this external circumstance. The Tænia may come from without; and so, it would appear, may the Ascarides; and so, in all probability, may the Ascaris Lumbricoides.

Generally speaking, these worms prevail more especially in proportion as the patient is weak. You are aware that persons who are exhausted from fever, will become the subjects of vermin. In extreme debility of the constitution, you may have a patient cleaned several times a day; and be covered with a fresh crop of vermin. So it is, in general, within. The more weakness there is of the body, the more the entozoa thrive. Bad air, bad food, and the want of sun, will contribute to their appearance. I formerly mentioned, that when rabbits are kept in a bad place, they will become subject to Hydatids. Sheep in wet pastures, also, become subject to these animals.

There can be no doubt that children are much more disposed to Ascarides and to Lumbrici, than other persons are; and not only so but, as age advances, the constitution frequently becomes so unfit for the continuance of these worms, that they are absolutely shaken

off without any physic at all. There can be no question,—at least, there is none in my mind,—that children cease to become the prey of worms. Thousands have Ascarides when they are young, and never have them afterwards. This is not so common an occurrence with regard to Lumbrici, as with regard to Ascarides; but the remark is correct there, to a certain extent. The early period of life seems to favour these animals;—why, I do not know; but such is the fact. You will see some of these worms in persons of the highest health. You will see persons with a good colour complaining of worms; and they will be able to verify their assertion.

With regard to the *symptoms*, worms sometimes produce the most distressing effects;—so as to make life a burden. At other times, they produce no symptoms at all; and a person only knows that he has worms, because he discharges them. I have seen many individuals who, to their great astonishment, discharged several feet of Tape-Worm;—not having had the least idea, previously, that there was any thing the matter with them.

In enumerating the symptoms, I will begin with the head, and go downwards;—for the sake of assisting the memory. When worms exist in the alimentary canal, then the symptoms usually are headache, heaviness, giddiness, depression of spirits, and even convulsions. Sometimes the headache is sharp; sometimes it is dull; and frequently there is a stabbing of the temples. Perhaps there is regular epilepsy; and some authors even mention tetanus. There is a black circle around the eyes; paleness of the face; more or less tumidness of the upper lip; great itching of the nose; foulness of the tongue; thirst; offensiveness of the breath; palpitation; shortness of breath; cough; and even hæmoptysis. Then (to go below the diaphragm) we have either anorexia, or excessive appetite; nausea; vomiting; a gnawing pain at the scrobiculus cordis; pain, perhaps all over the abdomen, or in various parts of it; griping; purging; itching of the fundament and of the genitals; a discharge of mucus from the rectum; feverishness; and emaciation. The pain of the abdomen is sometimes a *pricking* pain; and there may be tenderness of it. These are the symptoms which worms produce; but, of course, you do not see all these in every case. On the other hand, worms will exist in the alimentary canal, without giving rise to any symptoms whatever.

As to getting rid of worms, in the first place, any brisk purgative may answer the purpose. A good dose of calomel and jalap is an old remedy, and a very excellent one. Sir John Pringle used to give twelve grains of calomel, and half a drachm of rhubarb. Some give gamboge; but I do not know its specific power. It produces nausea; and is not so good as calomel and jalap.

But besides these remedies for the *expulsion* of worms, we employ others for the purpose of *destruction*; and one of the best is, unquestionably, oil of turpentine. In the case of Ascarides,—which are easily known from their crawling out, from their appearing in the stools, and from the extreme itching which they cause in the rectum,—it is best to give the oil of turpentine by injection. You

thus send it immediately on the parts where the worms reside; you save the patient the unpleasantness of a filthy dose; and you save the stomach from great disturbance. From a drachm to half an ounce, mixed with gruel, may be given to a child, and it will often bring away thousands. Adults will take a larger dose in an injection;—an ounce or more; but perhaps a very large dose is not so well. It causes so much irritation, that it may produce an immediate expulsion. It may not lie long enough to kill the worms; but may be discharged from the intestines. In the case of other worms, the oil of turpentine should be given by the mouth; and the dose is then from half an ounce to three ounces. In females, half an ounce is generally a proper dose to begin with; and it is seldom right to give more than an ounce; but in men, if they be not particularly delicate, it may be right to give two ounces. It is best not to give it fasting; lest it should create sickness, and be lost. Patients had better take it a couple of hours after some meal; and they ought to remain perfectly quiet;—lest vomiting should be induced. It may be taken pure;—in the same way as a glass of spirits; or in gruel, or in any thing else which the patient chooses. The effect it generally produces, is that of making the patient sick, purging him violently, making him giddy, and causing extreme vertigo. These will all go off; but occasionally the medicine will not purge itself away; and, therefore, it is best to give a dose of castor-oil; and to repeat it every hour or two, till the medicine passes freely. It rarely affects the urinary organs; but sometimes it does. Now and then you will have bloody urine, a frequent desire to make water, and great pain; but, in general, these effects do not occur; and when they do, there is usually an idiosyncracy; and they will occur from the smallest doses. Large doses usually work themselves off; but where they do not, I have seen these effects. Where the remedy does not produce irritation, it has been absorbed; and the urine has smelt strongly of it, for several days. I conclude that, where it produces violent symptoms, there is a little idiosyncracy.

The history of our knowledge of this medicine, is rather curious. So far as I have read, it appears that its use, in the cure of worms, was first mentioned in 1792, by a general practitioner, at Putney, of the name of Madden. A man had been long accustomed to pass Tape-Worm; and a friend advised him to take oil of turpentine. He took two drachms; and, to his great astonishment, discharged five yards of Tape-Worm, and several pieces afterwards. At the time Mr. Madden wrote, which was three years and a half afterwards, he was quite well. This fact was lost sight of,—not in the least attended to, till a paper was published, in 1811, in the "Medico-Chirurgical Transactions," by a physician at Durham. It gave an account of a sailor, who had been in the habit of taking gin to expel a Tænia; but at last it failed; and he took a glass of oil of turpentine;—thinking that that was stronger. It was quite successful. What is very curious, after this paper was written, some other person, in 1817, published a paper in the "Transactions of the London

Medical Society," in which Mr. Madden's account was contained; and claimed the discovery of the remedy. The circumstance was forgotten; and the Society allowed the second paper to be published. Oil of turpentine is one of the best remedies that we have. It will expel all sorts of worms;—Ascarides, Lumbrici, Tænia, and all the others. Occasionally it will fail; but you should give it in large doses, and take care that it finds its way out. You should follow it up with a dose of castor-oil every two hours; otherwise the patient may be brought into some danger. I have seen a degree of danger produced in a child, from inflammation of the intestines coming on; but it went away in a few hours. The oil of turpentine has been particularly used in the case of Tapeworm in the intestines; but it is equally good in the case of other kinds of worms.

Before concluding the subject of these worms, I should state that we are not quite certain with regard to some of these, whether they deserve the name of "*ec*tozoa" or "*en*tozoa." Those that *reside* within, *breed* within;—entozoa have particular residences. Some invade the alimentary canal generally; and others reside in particular parts of the canal. The same thing has been observed with respect to those which reside on the surface. Whether they have an external origin or not, we are not quite certain. Then, again, there are some vermin (small lice) which live only in the head; and it is said that they will not thrive any where else. There are others which live only on the body; and it is said, that if you put them into the hair of the head, they die. These have been vulgarly named *crab-lice*; but scientifically they are called *pediculi pubis*. They thrive only on the pubes.

I should mention that there is a particular kind of flea,—very large,—a sort of giant,—which passes under the name of *chiggre*. This is found particularly among the negroes, and is a source of great trouble to them; for it is so powerful, that it gets under the skin, and there burrows, and forms a bag, in which it lays its eggs;—the result of which is a very troublesome ulcer. I had a patient at St. Thomas's Hospital, who had lost the nail, and the extremity of each great toe, through chiggres. There was a cicatrix running across the toe; which cicatrix had been occasioned by this animal. The negroes are very expert at taking them out, in whomsoever they occur. The great point is to remove the bag entirely; for if any part remain, an oozing occurs, and no good is done. There is a story told of a person, who was anxious to have it put to the test, whether chiggres were a particular sort of flea, or only a variety of the common kind; and he therefore let one which had got under the skin, go on burrowing; in order that he might observe its increase and habits. The consequence was not only a troublesome ulcer, but mortification. A gentleman, who has been much in the West Indies, is of opinion that that kind of elephantiasis which is called *Barbadoes-Leg*,—in which the skin becomes exceedingly hypertrophied,—and that disease of the scrotum in which the skin and the subjacent cellular membrane are excessively hypertrophied (just such a case as

occurred in the Chinese at Guy's Hospital *), all arise from chiggres, Whether he is right in his opinion, or what grounds he has for it, I will not pretend to say; but he is a man of very careful observation.

The dolichos pruriens (cowhage or "cow-itch") has been used particularly against the Lumbrici; and the best account I can give you of that remedy, is to be found in a work, written some years ago, by a general practitioner of the name of Chamberlain.† The pubes, or small spiculæ of the dolichos, are scraped off, and made into an electuary; and the electuary may be given in almost any quantity. I have found the oil of turpentine so efficacious, that I have not had much recourse to "cow-itch;" but Mr. Chamberlain mentions, that you may give a large quantity of it. A woman, at St. Thomas's Hospital, took a drachm of the pubes of dolichos, twice a day, for five days; and afterwards a purgative was given to her. The proper mode of exhibiting it is in an electuary, made of senna or treacle. As good a mode of exhibiting it as you can adopt, is to thicken it to a proper consistency with treacle; and to let the patient take a teaspoonful of it, two or three times a day. You should occasionally give a purgative. It appears to do no harm. The only inconvenience which my patient experienced, was a tingling in the mouth; but when it had once got into the alimentary canal, no further unpleasant symptom arose. The bark of pomegranate-root has also been particularly recommended. Half a drachm may be given every half hour, till vertigo is produced. You will find a good account of this, in the eleventh volume of the "Medico-Chirurgical Transactions." It has the effect of producing giddiness, sickness, convulsions, pain in the head, and purging. There is no rule for the quantity that will produce this, and therefore it is well to give half a drachm of the powdered bark, in some water, every half hour, till the patient begins to feel sickness, or it purges him. It is for the Tænia that this is particularly recommended; and there can be no doubt at all of its virtue. These are the only things with which I am practically acquainted. Steel-filings have been mentioned; and a woman once took an ounce and a half in a day. They purged off with a cathartic; but without any sensible effect whatever.

You will find, in books on Materia Medica, a number of medicines recommended. The bark and shoots of the "bastard cabbage-tree," and of the fern, have been particularly spoken of as a remedy for Tænia. Indian pink (which is an acrid narcotic) has undoubtedly been useful. You will find a curious case, in the second volume of the "Transactions of the College of Physicians," of a man who took two pounds of common salt, in four pints of water; and, by that

* This refers to Hoo Loo, an unfortunate Chinese; who came over to this country, expressly to have a large tumor removed from the scrotum. The operation was performed at Guy's Hospital; but the patient did not survive. An account of this case will be found in the "Lancet;" (No. 398, Volume II. 1830-1, Page 86). Mr. Liston has, in his Museum, an enormous tumour of this kind, which he removed successfully.

† "Treatise on the Efficacy of Cowhage, in Diseases occasioned by Worms, &c. By William Chamberlain."

means, got rid of an immense number of Ascarides. It is well known that salt is rather a preservative against worms. The flukes which are found in sheep come, it would appear, from stagnant water; and it is said that, by giving the sheep plenty of salt, you may prevent them from becoming the victims of fluke. Electricity has been employed;—the passing of shocks through the abdomen; and now and then a worm has come away. It has been rendered uneasy, and has endeavoured to escape.

But besides those means which are necessary to expel the worms, it is of the highest importance to restore the health. There can be no doubt that worms derange the health; and if you can get rid of them, health will return. But they are frequently present on account of bad health; and therefore, though it is necessary to expel them by common purgatives, (which often answer very well), you must, at the same time, endeavour (by all the means in your power), to restore the health; to take care that the patient has wholesome food, and to put the digestive organs into the best order you can. If this be done, you will frequently find worms disappear, without any other means being employed. Without giving any purgative medicines whatever,—without doing anything to expel or destroy worms, you will find, in a great number of cases where children have become their prey, that they will spontaneously cease. Children are far more subject to Ascarides and Lumbrici than adults; and a great number of children have them at a particular time; but as puberty arrives, the constitution is less favourable as a habitation for worms; and they cease spontaneously. Most of us have been freed from worms spontaneously; although they may have been a great torment to us at the younger period of life.

One kind of worm, as you will recollect I mentioned, is found in the bladder; and this is called the *Strongyle*. Dr. Davis, of this University, once shewed me a phial, containing a large number of them,—all creeping about in full animation,—which came from the bladder of a female. She had discharged a large quantity of them, for a considerable time. Mr. Lawrence has described a curious case of this kind, in one of the volumes of the "Medico-Chirurgical Transactions." In that case, from eight hundred to one thousand of these worms were discharged from the bladder in about a year. Some of these were an inch in length. They were very hard and firm. These worms cause great irritation, a frequent desire to make water, and sometimes bloody urine. In the fifth volume of the "Medical Essays" (which is a very excellent work) there is an instance of one an inch in length, and as broad as the smallest part of a needle. It was discharged, after having produced bloody urine for many years. What could be done in a case of this description, I do not know. Whether turpentine given by the mouth would answer, is doubtful. It would find its way to the urinary organs, because it impregnates the urine; but whether in sufficient quantity to destroy the worm, I do not know. Whether it would be right to inject the bladder, I cannot tell; but first I should try an injection of olive-oil;—just as I should kill a flea in the ear. Whether these worms

are formed in the bladder, or come from the kidneys, I do not know. The point is not yet determined.

These are all the observations that I have to make upon the abdomen,—properly so called. I shall next treat of diseases of the urinary organs;—commencing with "inflammation of the kidney."

NEPHRITIS.

According to the rule which I have hitherto observed, the first disease of which I shall speak among those of the urinary organs, will be *inflammation*; and inflammation of the *kidney*; called *nephritis* (from νεφρος, *the kidney*; and "itis,"—*inflammation*). In this disease there is pain in the loins; but it is usually experienced on one side only. On account of the great sympathy that exists between the kidney and the stomach, there is very frequently nausea and vomiting. In inflammation of the *heart* and *lungs*, you do not have vomiting; but in inflammation of the *kidney*, you generally have more or less disturbance of the stomach;—either nausea, or absolute vomiting. From sympathy among different parts of the urinary system, there is usually a frequent desire to make water. The pain is not confined to the loins; but runs along the ureter, towards the bladder. The testicle of that side is generally painful and contracted;—drawn up; and very frequently indeed it is swelled. There is also numbness in the inner part of the thigh;—I presume from an affection of the anterior crural nerve. The pain is seldom felt at the *back* of the *thigh*. It does not run down that part of the limb, like sciatica; but is felt *anteriorly*,—along the course of the ureter, down the testis, and down the inner part of the thigh; where the anterior crural nerve is situated. The testis, indeed, is sometimes not only swelled, but sore to the touch; and sometimes it, as well as the inner part of the thigh, experiences a sensation of numbness. The urine is generally scanty and red;—following the course that is usually observed in any active inflammatory disease; and the kidney being the part affected, it is more scanty, and of a deeper red, in nephritis, than in other inflammations. On the other hand, the urine is sometimes not deficient in quantity; and occasionally it is found to be very pale; but, as a general rule, it is scanty and red.

In a *rheumatic* affection of the loins, the pain is usually felt on both sides; and it is felt to a great extent;—it generally affects a large surface. It runs to the hip; and, if it extend at all, it proceeds down the outer part of the thigh;—taking the course of the sciatic nerve. There is not a frequent desire to make water; there is no pain in the course of the ureter; no enlargement of the testicle; nor any pain in the inside of the thigh. Motion, in that disease, very frequently produces pain;—pain extending perhaps to the thigh, and especially about the joint, and about the trochanter. The large trochanter is not only painful, but perhaps hot and swollen. Very often you have rheumatism in other parts; and, very frequently, there is profuse sweating. The absence of all *urinary* symptoms (if I may so call them), and the situation of the pain,—in addition to

the common symptoms of acute rheumatism,—enable you, in general, to distinguish the disease perfectly. I was able in one instance, to make an accurate diagnosis, where some little difficulty was thrown around the case. There was a man in St. Thomas's Hospital, who had been there, six or eight months previously, for a decided affection of one kidney. There was pain in one part of the back, extending down the ureter; the testis was retracted; and there was an affection of the urine. The case was treated as *nephritis*. But he now came in with what was decided *rheumatism*. There was pain on the outer side, lower down than the kidney. It did not extend in the course of the ureter; but ran down the course of the sciatic nerve, and particularly affected the joint, which was painful on motion;—showing the effect of rheumatism. He did not make water more frequently than he ought; but there was pain in one point anteriorly. That, however, arose from an evident circumstance; it was in the situation of the glands, which were inflamed. He was treated by acupuncture; and making his mouth sore; and he speedily got rid of the disease.

Nephritis more frequently may be produced by cold, like any other inflammation; but it is rarely an idiopathetic disease. It is the result either of mechanical violence, or of some acrid matter which has been taken; such as turpentine or cantharides. Or it is the result of stones existing in it, or of some disposition perhaps to gout. If the disease go on to great violence, suppuration may occur. There is then less pain; rigors may be experienced by the patient; and pus may appear in his urine. The discharge may take place in that direction; or it may present itself at the back;—giving the appearance of a lumbar abscess, perhaps. Sometimes, however, it has been known to open into the intestines. Various terminations have occurred; all of which you may imagine beforehand. The pus has sometimes been collected into an abscess; and sometimes it has appeared in separate portions;—forming so many minute specks, with which the organ has been studded.

As to the *treatment* of the disease, it consists in bleeding at the arm; cupping on the loins,—either alone or after general bleeding; purging, especially by calomel; putting the patient into a warm bath; and low diet. If the kidneys suppurate, it is necessary to treat it as any other suppuration. You must support the strength; tranquillize the patient by anodynes; and perhaps give uva ursi. Some recommend this drug; but whether it has any particular virtue I do not know. The common treatment of suppuration, in any part of the body, is that which is required.

HÆMATURIA.

The kidneys are subject to hæmorrhage; and when blood appears in the urine, the disease is called *hæmaturia* (from αιμα, *blood;* and ουρον, *urine*). Blood may appear in the urine from an affection of the kidneys, or of the ureters, or of the bladder, or of the urethra, or of some other part opening into the kidney. The blood is occa-

sionally diffused through the urine;—you see the urine containing a sediment, which is evidently a mass of blood; and sometimes you see blood discharged without any urine.

If the urine be red in consequence of the presence of blood, I think you may always distinguish it by the eye. It is not of a deep orange-colour; but is of downright red. You may always distinguish it from the most red sediment, produced by feverishness and inflammation. It is a true red;—such as no one, I think, can mistake; but if you have any doubt, you may dip a rag into it; and you will find it stained red;—without any tinge of yellow, or any orange-tint; as is the case in the highest-coloured urine if no blood be present. Frequently blood is discharged so pure, or in such a quantity, that, independently of the colour, you ascertain at once what it is. But you have another point to ascertain. After you have distinguished whether it is blood or not, you have also to find out where it comes from;—whether it comes from the kidney, or some other part. If it come from the urethra, that fact is easily known; because there is evident disease of the urethra. It is common in violent gonorrhœa; it is common in stricture; and also when a bougie is passed. There can be no difficulty, I think, in ascertaining whether the hæmorrhage comes from the urethra; the point most difficult to ascertain is, whether it comes from the *kidney* or from the *bladder*. It is rare for hæmorrhage to take place from the ureter.

I presume the mode of distinguishing between hæmorrhage from the kidney, and that from the bladder, would be by observing where the other symptoms reside;—whether in the loins, or down in the pelvis. Sometimes, I believe, it is impossible to make an accurate diagnosis. I recollect having a case of fungus hæmatodes of the bladder, which was productive of no pain, nor of any irritation whatever. The only symptom the man had, was a discharge of blood from the urinary passages. I could make out no disease at all. He died under the repeated hæmorrhages; and, at the autopsy, a fungus was found shooting from the bladder. But if there be any symptoms besides the bleeding, emaciation, and debility, you will observe whether they are situated in the *loins* or about the *bladder*. If they are in the *loins*, there will be pain there, most likely sickness, and perhaps tenderness in the region of the kidney. If the symptoms are in the *bladder*, you have pain about the pelvis, and a frequent desire to make water;—far more so than in the other case;—there will be far greater irritation. But it is to be remembered, that disease of the bladder and urethra will cause pain in the kidney; and that disease of the kidney will cause irritation about the bladder, as well as the symptoms I have mentioned about the testicle. The latter show how distant the symptoms may be, when the kidney is itself affected. Hence it is to be remembered, that there may sometimes be great difficulty in making out an accurate diagnosis; but generally, the presence of symptoms in the pelvis, rather than the loins; or in the loins rather than the pelvis; or the great intensity signs of nephritis;—pain in the loins, feverishness, quickness of

the symptoms at one spot, rather than at another, — will be the means of removing all difficulty.

With regard to hæmaturia at large, it is sometimes a disease easily cured; or, on the other hand, it may be very dangerous;—all depends upon the cause. It is sometimes inflammatory, and is attended with a quick pulse, a dry tongue, and even retraction of the testicle. It will then give way to the common treatment for nephritis. A bleeding or two, or purging, will generally get rid of it. When it is inflammatory, it is acute; and generally arises from some evident cause,—a "cold," or a blow, or some acrid substances that have been taken. The most common of the latter (and, indeed, the only ones that I ever saw produce it) are turpentine and cantharides. When it has arisen from these, it would be well to take plenty of diluents and demulcent substances. Water, with a quantity of gum in it, and mucilaginous matters in general, should be employed in addition to anti-inflammatory treatment.

Sometimes, however, this hæmorrhage is entirely passive;—not accompanied by any signs of inflammation. It sometimes occurs with typhus fever, sometimes with small-pox, and sometimes with purpura hæmorrhagica. Because it is a symptom of purpura hæmorrhagica, that is no reason why it should not be inflammatory; but it will take place where that disease arises entirely from debility, as well as when it is inflammatory. In these circumstances the treatment for passive hæmorrhage must be adopted; and turpentine will be found very useful;—not in *large*, but in *small* doses;—from twenty to twenty-five drops, every four or six hours. Of course the system requires support; and the common treatment of passive inflammation must be adopted, at the same time that you employ this specific remedy.

When hæmorrhage takes place in chronic disease of the kidney; when you have seen chronic disease previously existing;—when you suspect that there may be calculi in the kidney, or a cancerous affection of the organ, or any other structural disease,—the same treatment must be adopted. You cannot, in general, lower the patient. If there be symptoms of inflammation, you must act accordingly; but, in general, the administration of turpentine in small doses (carefully watching it lest it should irritate the kidneys),—together with the exhibition of opiates to relieve the pain and procure rest, and giving the patient good support,—is all that is needful. The treatment will give you no difficulty at all. You have only to treat it in the same way as you would treat hæmorrhage from other parts. You must consider what is the patient's strength, on the one hand, or his debility, on the other;—you must consider whether there are symptoms of active inflammation, or how far the hæmorrhage appears to be passive only. If the disease be not inflammatory, you will find that oil of turpentine is of as great use here, as in hæmorrhage from the alimentary canal; but it is necessary that you should carefully watch the patient; because that which is *passive* to-day, may, through sudden excitement, be *active* to-morrow.

This hæmorrhage occurs, sometimes, in a curious way. Like other hæmorrhages, it has occurred where the menses have been suspended. I once saw an instance of its occurrence, after hæmoptysis had been cured. Occasionally it will take place in men, and also in women; but more frequently in men who have been subject to a discharge of blood from the hæmorrhoidal vessels. When that discharge is stopped, they are in the predicament of a woman who is in a state of amenorrhœa. Generally speaking, these cases are not dangerous; but they require antiphlogistic treatment. If the natural discharge of menstruation has ceased, and inflammatory hæmaturia has supervened, it may be right to attempt to bring it back again.

ORGANIC DISEASES OF THE KIDNEY.

The kidney is subject also to *chronic* inflammation; but you usually see the effects of chronic inflammation in the form of organic disease. Occasionally the kidney becomes *enlarged*. There is no particular alteration of structure; but the organ is evidently *hypertrophied*, and is perhaps firmer than usual. I presume this is an inflammatory affection. We must suppose that over-nourishment is, more or less, of an inflammatory nature; and that, from the great activity of the circulation, deposition has taken place.

Sometimes the kidney will become very *turgid*, and very *red*;—merely as the result of a difficulty in the circulation. Sometimes, after great dyspnœa,—after obstruction of the *heart*,—after obstruction of the *lungs*, the kidney, on being cut open, has been found full of blood;—so that you might, at first, mistake the appearance for that of active inflammation. But if there be active inflammation, the kidney is generally found *soft*; whereas the effect of chronic inflammation of this organ, is either induration or hypertrophy.

Frequently the kidney, instead of being red, is *pale*. After death has occurred from chronic disease, the body is generally found to be wasted; and not only are the *brain*, and the *muscles* pale, but the *kidney* likewise. The kidney, however, is sometimes pale through disease of its own; and then it is generally firmer and harder than it should be. You will recollect that, when I spoke of induration as a common effect of inflammation, I spoke both of *red* and of *pale* induration; and each of these kinds occurs in the kidney.

But the kidney is sometimes very *red*, or very pale, only in *spots*; and then it has a *mottled* appearance; you have what is called "a *mottled* kidney." Morbid paleness usually occurs in the cortical part; but sometimes the whole kidney is in this condition. Hypertrophy, attended with redness,—when it is partial,—occurs in the cortical portion; and that also will give rise to a mottled appearance. You may have a mottled appearance from one part becoming morbidly pale, while the other remains natural; or it may arise from one part becoming morbidly red, while the other retains its natural paleness.

Occasionally you will see the kidney *granulated*. Small grains,

more or less firm, are seen in different parts. Whether this is local hypertrophy or not, I do not know; but it is found most frequently in the cortical portion. These grains are of all numbers, and of all sizes.

Occasionally the kidney becomes excessively *soft*; so that you may break it up with your fingers; and this, I presume, may occur very rapidly. I have no cases in point to support this opinion; but, judging from what occurs in the spleen and liver, I should think that the softening may be very rapid. I know that softening of the spleen or liver, will take place in the course of a few days. A person, in perfect health, may be suddenly taken ill and die; and you will find these parts so soft, that you can run your finger through them in every direction,—break them up in a moment; and therefore I can conceive that the kidney may become soft either in an *acute*, or in a *chronic* way. When this organ is soft, there is the usual difference;—that is to say, the softness is sometimes accompanied with redness, and sometimes with paleness. Sometimes there is *inflammatory* softening; and sometimes this change appears to take place without any connexion with inflammation.

The kidney will sometimes *waste*. If one kidney waste, it is usual for the other to double its natural size;—in order to perform the duty of both. Nothing is more common, than to find one kidney enlarged, in proportion as the other is diminished. This wasting of the kidney will sometimes proceed to such an extent, that you will scarcely find any remains of the organ. I have met with cases where the kidney was discovered with the greatest difficulty; so that those who have first examined the body, have said that there was but one kidney. What is termed "a *horse-shoe* kidney," is where there is only one. That, however, is a rare case; but the organ is sometimes wasted to a less size than that of a horse-bean. Atrophy of the kidney sometimes takes place, without any ascertainable cause. Sometimes it is the result of inflammation; sometimes it is the result of abscess. A great discharge will cause atrophy of part of the organ. We produce counter-irritation, for the purpose of lessening morbid growths, and morbid activity of the circulation; and if, without morbid growths and morbid activity, a discharge takes place by suppuration, the activity of the part is diminished, and wasting is a very common circumstance. An abscess, therefore, will occasion a part to waste; according to the general principles on which we employ setons and issues. But pressure will have the same effect. The pressure occasioned by a tumor in the neighbourhood of the kidney, has been seen to produce atrophy of the organ. It is stated, by authors, that atrophy of the kidney is sometimes partial; so that the medullary portion only is wasted, and the pelvis becomes a mere bag. Sometimes the *cortical* part is wasted; so that the cones within the kidney nearly touch the external fibrous membrane;—there being only a thin layer of cortical substance between. Thus, you see, there are various degrees of atrophy; and they have all been considered as a frequent result of inflammation.

We have, however, other organic diseases of the kidney. In the cortical substance, serous cysts are very common; and, by their pressure and growth, they will cause an atrophy of it. As they increase, they cause more and more atrophy; till there is little more than a bag left. Cruveilhier has given a very good representation of these cysts. They are found more commonly in the kidney and liver, than in any other parts of the body. Serous cysts are sometimes found under the external membrane of the kidney.

The kidney has sometimes been seen converted to fat. A great deposition of fat, I presume, has taken place in the cellular membrane, under the external coat; and the rest has wasted. Sometimes it has been converted into *jelly*. There is a peculiar substance sometimes formed in the kidney, called *cholesterine*; and the kidney sometimes contains a great quantity of it, causing atrophy of the organ itself. Occasionally *encephaloid* disease occurs in this part. You may have great *disorganization* of the kidney;—you may have *tubercles* of various kinds; and even *scrofulous* tubercles have been found here.

All these diseases may occur with very obscure symptoms; but sometimes they occasion dull pain in the region of one kidney, together with more cr less disturbance of the stomach. The diagnosis is generally difficult; unless the pain is very local, and unless the urine becomes morbid,—very much affected. Even then,—when you have satisfactorily made out that there must be organic disease,—it must be very difficult, if not impossible, to say what that organic disease is. Scirrhus is said to occur in the kidney; but whether the affection is scirrhus, cancer, encephaloid disease, or a mixture of these, or a scrofulous suppuration, it must be difficult to determine. If organic disease occur in a young person, and there is not much pain, you may suspect that it is encephaloid. If there be strong marks of scrofula;—if the ends of the fingers be enlarged;—if there be mesenteric disease, or phthisis,—you may suspect that the affection of the kidney is of a scrofulous nature. If the person be advanced in life, you may suspect scirrhus or cancer. But it must, as I have said, be very difficult to say what the particular organic alteration is; and it can make no difference as to the treatment; which must be conducted on general principles. Dr. Baillie states that, according to his observations, the kidneys are more frequently affected in *men* than in *women*.

DISEASES OF THE RENAL CAPSULES.

I may mention, as a point of Pathological Anatomy, that the renal capsules are rarely diseased, except from scrofula; but I have frequently seen them in that condition. Sometimes they are indurated; and the induration may amount to cartilage, or even to bone. As to the symptoms, nothing can be said on that subject.

FUNCTIONAL DISEASES OF THE KIDNEY.

Having spoken of those diseases which are the result of *inflammation* of the kidney, and of *structural* diseases, I will now proceed to

consider *functional* diseases of that organ. The kidney is subject to an *increase* and to a *diminution* of its secretion. It is liable to secrete *morbid* urine;—to secrete a substance which it ought not to form in that particular way; or which, if it be produced, should pass off with the urine. Besides these affections, the urinary organs are subject to be infested by worms.

ISCHURIA.

The first disease of which I will speak, is a diminution of the secretion; and this is called *ischuria* (from ισχω, *to restrain*; and ουρον, *urine*). The *suppression* of urine, the *absence* of urine, or the *diminution* of urine, when it occurs in the kidney, is called "ischuria *renalis*." If urine be formed in the kidney, but cannot escape from it, owing to some obstruction in the *ureters*,—then it is called "ischuria *ureterica*." If there be some obstruction in the *bladder*, it is then termed "ischuria *vesicalis*." If there be obstruction in the *urethra*, it is denominated "ischuria *urethalis*." There is no analogy in these different words. If the urine be *suppressed*,—that is to say, if none be *formed*,—we call it "*suppression* of urine;" if, however, it be formed, but cannot *escape*, we call it "*retention* of urine;"—so that "ischuria *renalis*" and "ischuria *vesicalis*" are not at all analogous; and young beginners are often laughed at in the hospital-wards, for saying "*suppression*," when they ought to say "*retention*;" and *vice versa*.

The *suppression* of urine,—a deficiency of the *secretion*,—may be entirely inflammatory; and then you have symptoms of nephritis, and you must treat it as inflammation. But sometimes this complaint is unconnected with any symptoms of inflammation of the part; and it certainly is then a curious affection; for it is usually followed by apoplexy. No urine is made, or scarcely any; and, at last, absolutely none. You feel no fulness of the bladder; and when you pass an instrument into it,—to ascertain whether it is a case of retention or not,—you find that the organ is empty. In general, the patient very soon becomes drowsy; which drowsiness increases, till he becomes decidedly apoplectic, and perhaps dies. Dr. Parr, in the "London Medical Dictionary," mentions a case, where no urine was made for six weeks; and Haller quotes an instance, in which it was said that no urine formed for twenty-two weeks. These are very chronic cases; and one cannot answer for the truth of that which Haller alludes to. I presume he mentions it on the authority of another. The disease has sometimes been ushered in with rigors, and sometimes not. Sometimes it has occurred without any particular symptom, till coma has made its appearance. Following the course of diseases of the kidney, it occurs more frequently in men than in women. It usually takes place in fat people; and especially in those who are upwards of fifty years of age.

When the urine has been suppressed in this way, it has occasionally escaped from some other part of the body; and when the urine has

not been suppressed, but, though formed, has not been able to escape,—in consequence of some obstruction,—it has been absorbed; and has passed off by some other organ. I know instances where it has been *vomited*; and I saw a case where it passed from the *skin*,—particularly the palms of the hands. Persons in these circumstances,—who have made no urine; or whose urine, when secreted, could not escape,—have occasionally vomited a fluid, which had the smell and taste, and all the other qualities of urine. Others have passed it in the form of perspiration. There can be no doubt of the truth of these cases. I presume that, in the latter case, the fluid has been absorbed, and re-secreted; and, in the former case, it has been secreted originally, and has not been absorbed at all.

In "ischuria renalis," it is very common for the individual to become apoplectic; and it is, therefore, a very dangerous disease. I have had but one case of it, and that occurred after a person had taken a quantity of corrosive sublimate by mistake. Proper means had been used, and no harm was thought likely to occur; but, after a certain time, the urine became suppressed. I think the individual had hemiplegia; but I recollect, perfectly, that he became drowsy; and the drowsiness increased till, at length, he became decidedly apoplectic, and died. One might imagine, in such a case, that the same occurrence must have happened, as when the urine has been vomited, or has been thrown off by perspiration;—namely, that the urine was re-secreted into the ventricles of the brain. One would say, *a priori*, that that was likely to take place; or, if no urine was secreted, that an excessive quantity of fluid would be found within the brain. Nothing of the kind, however, was discovered in this case. There was not only no *urine* in the head; but no excess of *fluid*, either *in* or *upon* the brain. That was a result for which we were not prepared.

The proper mode of treating these cases is to give cantharides. I do not know whether oil of turpentine has been tried; but cantharides, I know, is a proper medicine. In the case I saw, a blister was applied, and the medicine was given internally; but the patient died within a few hours of its exhibition. However, a friend of mine had two cases which occurred nearly together, in old people; and one of them was so bad, that Sir Astley Cooper, who was called in, had little hope of saving life; but he treated the case in a way which, he said, had been found successful; and the patient got perfectly well. In the second case, my friend adopted the same plan; and it was attended with the same success. In the latter case, it appears that the kidney had become torpid; but not through inflammation. Whether other diuretics would answer, I do not know; but it is said that cantharides should be given internally, and a large blister applied to the loins,—in order that the medicine may have more effect; because the surface has much influence over the internal parts. When it is exhibited internally, it should be in the solid form; because the tincture is a most uncertain preparation. You should give a grain once or twice a day, or every eight hours;

whichever you choose. A grain is a pretty strong dose; but, in a case of this description, there is no time to be lost, for apoplexy may soon come on; and therefore you should repeat the dose, as long as it does no harm. I have given ten, fifteen, or twenty drops of the tincture, without any effect; and, at last, I have been obliged to give two or three drachms. The tincture, I presume, was not good; but it has been so common an occurrence, with me, to find the tincture either bad from its nature, or bad from its being so continually ill made, that I place no confidence in it, in a case of life and death, where there is no time to be lost.

DIABETES.

The term "*diabetes*" is derived from the Greek word διαβαινω,—*to stream through*;—the disease being characterized by the "streaming away" of a considerable quantity of water. This affection, on account of the excess of fluid, has sometimes been called *hydrops ad matulam*,—"chamber-pot dropsy;" but as there is no *accumulation* of fluid, it cannot, without great impropriety, be called "*dropsy*." In dropsy there is an *accumulation* of fluid;—not merely a *formation* of it. It is formed faster than it comes away, and therefore it is termed "dropsy;" but as, in diabetes, the water comes away, the word *dropsy* has been applied to it with the greatest absurdity.

The word "*diabetes*" is usually employed to signify *chronic* excess of urine. A person would not be said to have diabetes, if he merely made a large quantity of urine for a day or two. The fluid may be either of a natural quality, or it may contain sugar. As, however, there is no distinct single name for that disease in which sugar is formed in the urine, and as it is sometimes formed without the urine being at all in excess, it would be well, perhaps, to restrict the term "*diabetes*" solely to *saccharine* urine, and to give such a name as "*polyuria*" (from πολυς, *much*; and ουρον, *urine*) to that form of the disease, in which there is merely excessive *quantity*. But you find "*diabetes*" employed to signify a chronic excess of urine, whether there be sugar in it or not:—the one being called "diabetes *insipidus*," and the other "diabetes *mellitus*,"—*honey-like*,—sweet to the taste. It was to an *excessive quantity* of urine, that the ancients applied this term; for it does not appear that they were at all aware, that the urine was ever sweet. I believe it was Dr. Willis, the English physician, who first pointed out that, in this disease, the urine is sometimes saccharine. The term is certainly employed by the ancients simply to denote a chronic *excess* of urine.

You are aware there is frequently a *temporary* excess of urine, in various diseases. In asthma, for example, a large quantity of pale urine is frequently made. So, again, in hysterical and dyspeptic people, this is often the case. You know, likewise, that fright will cause a temporary excessive quantity of urine; so that persons who have been waiting anxiously to be called into a room, have been obliged to walk out twenty times in the course of an hour. Long-continued grief and anxiety, have the same effect. I have known

persons, from leaving off some of their clothes, make a considerable quantity of urine; and it has been remedied by wearing their usual quantity of clothes again. But, independently of the circumstances I have now mentioned, there is sometimes formed an excessive quantity of urine; not at all impregnated with sugar, and occurring without any evident cause. This form of the disease,—which (as it sometimes has been) might as well be called *polyuria*,—is occasionally followed by that form in which the urine contains sugar. But sometimes it exists alone; and I believe that, not unfrequently, after a length of time, it will cease. This incipient diabetes is more common in women, than in men. The urine is very pale, in general; and if it continue, thirst and dryness of skin are mechanically produced. An excessive secretion of water is going on in one part of the body; and there is therefore less water for the secretion of the mouth and skin. From the loss which the body sustains, there is also weakness and hunger. This condition may frequently be recovered from, by wearing warm clothing, employing the hot-bath, or going to a warm climate; and by the exhibition of iron. Persons who have laboured under this form of the disease have, by medical men who have not properly examined the urine, been said to be cured of diabetes; as though they had had the saccharine form of the disease.

In diabetes mellitus, or *true* diabetes, there is sugar in the fluid; and generally there is also an excessive quantity of fluid. The general symptoms that I just now mentioned, are produced in this affection. From the loss which the body sustains, there is great debility; from the body losing its nourishment, there is hunger; and from the want of fluid, there is thirst and dryness of skin. The hunger is sometimes excessive; so that the patient not only feels very hungry at the usual time of his meals, but he feels hungry during the greater part of the day. The food which the patient takes, does him (he says) "no good;" and he is presently anxious for more. Patients generally complain of a sinking at the pit of the stomach; and the uneasiness there occasionally amounts to aching. The thirst is sometimes so great, that many quarts of fluid are drunk in the course of the day; and the skin is sometimes so dry, that the hair falls off. The feet and hands are frequently cold; there is lowness of spirits; and, in almost every case, peevishness and fretfulness. There is also one very remarkable symptom;—the loss of sexual power and desire. I have never found this symptom absent; and sometimes is has been the very first symptom noticed by the patient. I never had a patient labouring under diabetes, in whom the feeling of sexual power and desire had not ceased entirely, or become very much impaired. This symptom is not noticed by all authors; and a patient, of course, will not mention it to you; but if you make a point of inquiring into it, you will, I believe, nearly always find it to be a fact. There is also frequently pain of the loins; but whether it arises from an affection of the kidney, or is merely a symptom of debility, I do not know. Although

the whole body becomes emaciated, there is frequently œdema of the legs; and usually there is costiveness. From the deficiency of fluid in the alimentary canal, there is not only dryness of the skin, and thirst, but the tongue is sometimes white and clammy. Frequently, however, it is smooth and red; and the saliva and mucus are excessively tenacious;—so that the patient is very much annoyed. The gums, sometimes, become very red, and slightly ulcerated. The saliva is occasionally sweet; and so likewise is the breath. Dr. Latham says that the body smells like hay. I have not observed this; but the breath frequently has sweet smells;—has something of the odour mentioned by Dr. Latham. Very often there is redness and soreness of the end of the urethra. I have ever seen phymosis; which may arise, perhaps, from the irritating quality of the fluid. We usually find the pulse quick,—perhaps full; and at last it becomes weak. There is a hectic appearance in the patient's face;—you frequently find a flush upon his cheek, as well as quickness of the pulse; and, at last, you have decided hectic. In many cases there is great sweating,—I have frequently seen it. Phthisis is a very common termination of this complaint. Indeed, the majority of diabetic patients whom I have attended, have died of phthisis. The urine has a particular odour, which is not perceived by smelling the pot; but if you partly fill a phial with it, and keep it corked for a little time, on withdrawing the cork you may perceive a peculiar smell,—something like peppermint. It has also a sweet taste; which you may ascertain by desiring the patient to taste for himself. Generally the urine is clear, and of a lemon-colour. Besides the presence of sugar, there is usually a diseased secretion altogether.

Professor Frank, of Vienna, saw a case in which, on an average, forty pints of urine were made in a day. There were sometimes as much as fifty-two pints. He says that other authors have mentioned fifty-two pints being discharged. He also states that he saw a case, in which the quantity voided, in a very few days, exceeded the whole weight of the body. Usually, however, the quantity of urine discharged, is from six to twenty pints *per diem*. On the other hand, the urine is sometimes very little increased in quantity; and sometimes not at all. Professor Frank mentions a few cases of the disease, where the quantity was not increased; but it contained so much sugar, that from two pints of fluid six ounces of saccharine stuff were obtained. One patient of mine made, at last, but three pints of urine in a day;—which was less fluid than he drank. Dr. Heberden mentions a case, in which the urine made was double the quantity of the fluid drunk. Such are the varieties as to the quantity of urine.

With regard to the quantity of saccharine matter, Dr. Dobson procured an ounce of saccharine extract, by evaporating a pint of urine. Cruikshank obtained three ounces and a quarter from thirty-six ounces troy; and found the specific gravity to be 1·040. From ten pints of urine, he obtained a pound and a quarter of solid extract. Dr. Prout, from a pint of urine,—the specific gravity of

which was 1·050,—obtained two ounces of thick stuff; and from this he procured one ounce and a half of sugar. Frank says that, from twenty-four pints of urine, he obtained twenty-six ounces of saccharine extract. The sugar obtained from urine, is like that procured from grapes. From the presence of sugar, the urine undergoes a vinous fermentation; so that, at a certain time, if it be thrown into the fire, it burns;—just as if you had thrown in so much spirits. Still later the urine becomes quite sour. The usual changes which sugar is capable of producing go on; that is to say, you have vinous and acid fermentation.

These, however, are not the only circumstances in this disease; for there is frequently but little urea in the urine;—little lithic acid, and little of the usual salts. Not that they are *absent*; for I saw them all myself in the patient's urine, which I mentioned as containing so large a quantity of sugar. But it is said that, in general, they are very *deficient*; and deficient in proportion to the quantity of sugar formed. The weight of the urine, in this disease, depends upon the quantity of sugar; and the quantity of sugar is such as to augment the weight very considerably. The specific gravity of healthy urine is generally from 1·010 to 1·018; but *diabetic* urine is from 1·030 to 1·050; and I think I have seen it above that. This excessive weight, as I said before, depends upon the presence of sugar.

It has been supposed that the presence of the sugar is dependent upon the deficiency of urea; and urea and sugar, you know, contain exactly the same quantity of *hydrogen*; while the quantity of *carbon* and *oxygen*, in sugar, is twice that of those substances in urea. It has therefore been supposed, that there is only a morbid change undergone in the composition of the urine;—that instead of *urea*, you have *sugar*. However, this is certainly not accurate; because I have seen a large quantity of sugar in the urine, where there was likewise a considerable quantity of urea. Still, it frequently does happen that, in proportion as the one is deficient, the other is abundant. It is by no means proved, I think, that sugar is merely altered urea; and those have mistaken the matter who say, that urea is absent in diabetic urine; for sometimes a large quantity of urea is found in true diabetes; where, of course, there is a large quantity of sugar.

If the disease take a favourable course, Dupuytren and Thenard assert that, before the salts and urea appear again, albumen is found. Dr. Prout mentions, that the worst form of diabetes is where the urine is albuminous;—where, besides sugar, you find albuminous flocculi in the urine. In a fatal case of mine, not long before death, there were albuminous flocculi. These flocculi increase the fermentation, which the urine experiences from the sugar.

It is pretty certain that no sugar is found in the *blood* of these patients. Dr. Prout, who is very nice in his examination of these things, says that he has sometimes seen something *like* sugar; but as

for *true* sugar being found in the blood, it has been looked for by a large number of chemists, but in vain.

In this disease, the blood is sometimes of an unnatural appearance. It is said, by Dr. Watts of Glasgow, to be a little like treacle, and of a bluish colour; but this is not an invariable circumstance; for I have not noticed it myself. It is asserted by Dr. Watts; who, I dare say, may be depended upon. The serum of the blood had a white fluid swimming upon it; and the blood was buffed. I mention this to show, that you may have these things, at the same time that the urine contains sugar. There is no connexion between them; only the presence of one does not exclude the possibility of the other being present also. I may mention that Vauquelin found no sugar in the blood of a person, whose urine actually contained one-seventh part of sugar. He also says that he found no *urea* in the blood of this individual; though he gave him a large quantity by the mouth, for some days. He also states that an opposite occurrence takes place here, to what is observed in scurvy;—namely, that the blood will not putrefy so soon as in health. In one case of my own, and which I believe was the only case in which experiments were made, it was found that the more sugar the urine contained, the larger was the quantity of carbon discharged from the lungs.

This disease may last many years; and it may prove fatal by phthisis;—that is to say, it may induce phthisis, or be followed by it. Express the fact in any way you choose;—diabetic patients frequently die phthisical. They sometimes die from mere exhaustion, occasioned by the disease; and sometimes they die suddenly; but the most common terminations are phthisis, and mere exhaustion. It may destroy a patient in a year or two, or it may remit; and I believe it may cease, or be cured. Dr. Gregory used to say that he knew a case, where the saccharine quality of the urine ceased in two days, and did not return; but whether the observations were made with all the accuracy that we require, in modern times, I do not know. Usually the appearance of sugar, and the excessive quantity of urine, decline together;—that is to say, in proportion as the quantity of urine becomes less, so does the proportion of sugar. You may have the quantity of urine diminished, and yet the proportion of sugar to that quantity remain the same; and, on the other hand, it is asserted (though I have not seen it,) that the sugar sometimes diminishes in absolute quantity, while the urine remains in the same excess as before. As, however, the sugar absolutely lessens, so do the salts, the lithic acid, and the urea, generally increase. The colouring matter of the urine is usually deficient, as well as the lithic acid and salts; and sometimes the sugar entirely disappears before death. I have seen the urine, in diabetic patients, suddenly cease to have a particle of sugar in it; and yet the patient has died in the course of three or four days.

After death, you will frequently find no morbid appearances whatever. I have several times opened diabetic patients; and, as

far as I could judge, I have found the whole of the body sound throughout. The kidneys have sometimes been enlarged a little;—sometimes a little redder or fuller than natural, and a little flabby; but that has been all; and sometimes I have not seen even that. The ureters are said to be sometimes florid; but Morbid Anatomy alone certainly gives you no explanation of this disease. Suppose you see the kidney fuller or larger than natural, and the vessels rendered more distinct, that is nothing more than you would expect, from the kidney being stimulated to excessive action; and whatever may be the cause, that appearance of the kidney certainly does not explain the saccharine quality of the urine.

Diabetes is by no means confined to adults; for it frequently affects children also; but it is not so easily observed in them. It occurs much more frequently in men, than in women; and it occurs much more frequently in some countries, than in others. Professor Frank says, that he saw but three cases of it in Germany, for twenty years; and that when he practised in Italy, he saw but seven cases in eight years. There are far more cases of it in Edinburgh, than in London. When I was a student in Edinburgh, there were always some cases of it to be found; but I do not recollect having a case in London, for two years.

Sometimes it is produced by grief. I have seen it produced by the long continuance of the depressing passions. It is sometimes occasioned by chills;—by the exposure of the body to heat and cold alternately;—especially when the body is in a state of perspiration. It sometimes appears to arise from strains of the loins. Whether whiskey has any particular power in producing it, I do not know; but it is far more common in Scotland, than in England. I suppose they drink as much whiskey in Ireland, as in Scotland; but whether the disease is equally prevalent there, I do not know. Dr. Latham says, that he has seen the disease come on after boils; and I have heard others, I think, confirm the observation. Excess of venery appears likewise to be a cause of it. Some authors mention this most decidedly, as a cause of the disease; and, in some instances, I have asked the question of young men; and they have replied that they had indulged to great excess. Whether they had or had not, I cannot say; because people feel differently as to what is excess. I saw it, however, in one man, who had committed no excess of this kind; for he said he had never "known a woman;" but he died of the disease; and it is very possible he had committed excess of a less creditable kind. I rather think this was the case, from the great length of the prepuce. Sometimes there is no evident exciting cause at all; and, in some cases, it is evidently constitutional and hereditary. One German writer mentions having seen seven cases of the disease in one family. Dr. Gregory said that he saw three cases in one family; and Dr. Prout knew a mother, an uncle, a brother, and a sister, all affected with the disease.

The diagnosis of the disease is easy enough. It may be made by measuring the quantity of fluid, by weighing it, and by analyzing it.

You obtain, in diabetes, a brown treacly extract; which, on tasting, you find to be sweet. No one can object to taste it; for it is not urine, but sugar. When the fluid is evaporated, there is nothing left but "hard-bake;" which tastes just as well as any *other* "hard-bake." But although the disease is made out easily enough, when you suspect its existence, and it really does exist, yet it is a disease which is continually overlooked. It comes on so insidiously, that many persons have it for a length of time, before the medical attendant suspects its existence. The patient complains of being weak and languid; does not know what is the matter with him; and the quantity of urine may not be such, as to attract his attention;—so that frequently no light is thrown on the disease. I have known so many cases of this kind passed over, that when I see a patient complaining of weakness, and can discover no evident cause, I always question him as to the quantity of urine. Not long ago, I saw a patient who must have had diabetes for some years; but that circumstance never struck my mind. He had disease of the heart, which was killing him; and it was not till I saw him three or four months afterwards, that he spoke of the quantity of his urine. The disease of the heart explained every symptom of which he complained; but upon being told that there was something wrong in his urine, I evaporated a portion, and found it was diabetic; and he then stated that, for several years, he had made an excessive quantity of urine. No disease is more easily passed over;—unless the patient chances to mention, that he makes a larger quantity of urine than usual. When you see a patient emaciated, complaining of thirst, with a good appetite, and a dry skin; while you can see no reason for these symptoms, either in the chest or abdomen,—it is well always to inquire into the state of the urine.

As to the real nature of the disease, some declare it is situated in the kidney; others that it is situated in the stomach. Many of the symptoms are as easily explained on *one* supposition, as on the *other*. Many of them are referrible altogether to the discharge of fluid. The thirst and the dryness of skin are referrible to the loss of fluid. So, again, the costiveness, the emaciation, the hunger, the debility, and the sensation of sinking at the stomach, are all referrible to the mere loss of so much substance, as must be lost in the production of sugar. But the absence of sugar in the blood, and the very frequent absence of dyspepsia, or anything connected with the stomach, except the hunger, (which the excessive loss will explain), make it appear to me most probable that the disease is situated in the kidney.

Perhaps this is the most singular disease in the animal economy; for the nature of it is not known; and the treatment which is found useful, is as singular as the disease itself. The remedies are directly opposite. There can be no doubt that repeated venesection has sometimes lessened the symptoms very much; and it is sometimes borne remarkably well. You will find a sufficient number of cases on record to establish the fact, that bleeding is occasionally very useful in the disease; not bleeding to syncope,—not *violent* bleed-

ing; but *repeated* bleedings,—taking from eight ounces to a pint. I have employed this method; and have seen it borne in a remarkable manner. In many cases, the urine diminished and the quality improved, while venesection was going on. But though there can be no doubt of its utility, yet it has frequently failed. Some prefer the application of leeches to the epigastrium; and some cupping on the loins. Then, again, stuffing the patient with rump-steaks (which is a practice directly opposite to bleeding) has also answered as good a purpose. Many persons have their urine improved, by being confined to animal diet,—eating nothing but meat; but still one would imagine that this would not go to the root of the complaint, wherever it may be. It is like giving phosphate of lime in softness of the bones, and taking carbonate of soda to remedy acidity of the stomach;—it is merely *alleviating*, not *curing* the disease. But you will find it the most difficult thing in the world to make a person adhere to animal diet. He becomes so disgusted with it at last, that he says he would rather starve than eat meat every day. I never found a patient able to continue it for a length of time. Still, as there is a great weakness, it may be well to make a patient live on meat as much as possible; and you will find as strong evidence in its favour, as in that of bleeding.

Then there can be no doubt that opium has a great power over the disease; it increases the quantity of lithic acid,—the quantity of urea; and lessens that of the sugar. I have seen this proved over and over again;—nay, so great is its influence, that a very great quantity will diminish the *urine*, as rapidly as it will diminish the *sugar* in the urine. I once, finding a man dying of the disease, gave him opium so freely, that it induced stupor, and some degree of delirium; and, in the course of sixty hours, the quantity of urine was reduced from *eight* pints to *two*, in the twenty-four hours; and, from being very heavy, it lost the greater part of its morbid specific gravity; and absolutely lost the whole quantity of sugar. Indeed, urea was produced in excess;—the urine contained more urea than it does in health. The man died, a few days afterwards, of phthisis; but the quantity of opium produced the effect I have stated. In general, by giving opium, in increasing doses, you lessen the amount of urine, and likewise the quantity of sugar. Of course, the opium may be increased, in this disease as it may in any other; and one man, who began with half a grain, three times a day, at last took as much as two scruples, three times a day. It never confined his bowels; which it usually does where patients take a large quantity. His urine became natural; when, through a mistake on the part of those who made up the prescription, he had forty grains of blue pill, which he took three times a day. Thus there was an *absence* of the *opium*, and the *presence* of a strong *purgative*,—a strong *mineral poison*; and instantly the sugar was brought back into the urine, in the original quantity, and the urine also was increased as before. The opium was renewed again; but I never made an impression on the disease afterwards. Whether the benefit would have continued, I do not

know; but the urine became healthy; the mistake was made; the patient fell back; and I never again made the slightest impression, by the same dose of opium.

It is said that other narcotics answer as well as opium; but I am not aware whether that is the case. However, I have never yet cured the disease even by opium;—at least, I am not certain of it. There was one man who, by repeated bleedings, *appeared* cured; but I did not see him afterwards. By opium, however, by animal diet, or by any other means, I do not know that I ever cured a case. I dare not say that the man was cured, in whom the repeated depletions were had recourse to. Of course I am speaking of *saccharine* diabetes; as for "diabetes *insipidus*," that may be effectually removed.*

The steam-bath and the hot-bath have been strongly recommended; but I confess that I have used them without any material benefit. Iron has also been recommended;—particularly the phosphate; but I employed the carbonate†, and it appeared useful; though I have never seen it cure the disease. I have not had sufficient experience of the disease in children, to say whether it may be cured. I saw a child, about two years ago, making an excessive quantity of urine; and I think this urine was said to be saccharine; but this state lasted only a few days. I will not take it upon me to assert, that the disease is never cured in children. Alum, catechu, and astringents, are said to be of service; and it is alleged that they have sometimes cured the disease. But what I would recommend, if the patient's strength would bear it, would be venesection, and a confinement as much as possible to animal diet; and there is no reason why you should not give opium, and at the same time phosphate of iron. These all act in a way that we do not understand; we are not sufficiently acquainted with the disease to say that they will not do good; and if I found a remedy serviceable, I would recommend a patient to use it. It is right always to make a patient wear plenty of clothes;—to keep the surface as warm as possible. Warm clothing, and exercise to sweating, have been recommended; but I have known persons perspire profusely in the disease, without any good being done.

EXCESS OF UREA IN THE URINE.

There is an affection very similar to diabetes, and sometimes mistaken for it; and that is, where the urea is in excess. I do not know that the disease has been noticed by any one except Dr. Prout; but I have seen several cases of it; all of which have done well. There is debility; lowness of spirits; pain in the loins; thirst; an excessive quantity of urine; a diminution and frequently a loss of sexual power; often irritation at the neck of the bladder; and a frequent desire of making water. The urine is pale, and likewise heavy,—perhaps the specific gravity is from 1·025 to 1·030. It is

* In the Lancet for December 1, 1832 (No. 483, Page 319) will be found a case illustrating the efficacy of Muriate of Morphia in this disease.

† The *Sesquioxide.*

acid: but soon grows alkalescent. On evaporating the urine, you find there is no sweet extract; and if you add strong nitric acid to the fluid, you have a precipitation of the urea. This state of the urine is frequently seen where the phosphates are in excess. Equal quantities of nitric and muriatic acid must be added, in order to produce crystals. The remedy for this state (as for diabetes) is opium, and likewise iron. I have seen these cases yield to the exhibition of one, or both these remedies. Dr. Prout has cured many cases, which were thought to be diabetes, till he examined the urine, and found no sugar in it. The patient complains of the symptoms I have just narrated; and if you find it to be this disease, it may yield to the remedies I have named. If the patient's health be improved, the disease may cease spontaneously. It is by no means a formidable disease,—like the formation of sugar.

You will recollect that I mentioned, before entering on the consideration of particular parts, that just as, with respect to the *solids*, we have an excess of developement,—an alteration of natural structure, so the same is observed occasionally in the *fluids*. The natural constituents become changed in their proportions; and just as, in one part of the body, we have cartilage, or bone, where it ought not to exist,—so, with regard to the fluids, we find them containing something which ought not to be there; but still something which is natural to the body; or we find them containing something in excess. Again,—as, with regard to *structure*, we sometimes have a new structure altogether,—a structure that ought not to be in the body at all;—such as melanosis (if you choose to call that a *structure*), and scrofulous disease, which is a foreign substance;—so occasionally, in the *fluids*, we find things that ought not to be there at all. Of these sugar in the urine is an instance. We have changes in the fluids analogous to *transformations* in the solids; and we have further changes, which are analogous to *new formations*.

SEROUS URINE.

Before speaking of that disease in which there is sugar in the urine,—which is a *new formation* altogether, and not found in any part of the body,—I ought, for the sake of uniformity and consistency of plan, to have said a word or two upon some other affections;—those in which there is merely a *transformation*, if I may so term it;—in which you find in the urine things which are natural to the *body*, although they ought not to be present in the urine. One of these articles is serum,—the presence of which is easily ascertained by the application of heat. It coagulates (as you know albumen does) at 160 degrees; or it will coagulate on adding a small portion of acetic acid, and then prussiate of potass. I spoke of this as occurring sometimes in inflammatory dropsy, sometimes where there is no inflammation to be discovered, and sometimes where there is no disease of the kidney to be ascertained. When serum exists in the urine, the urine may be of its natural quantity, or it may be below it, or it may be in excess. Generally the urine when made

is pale; sometimes it is, when first made, a little opaque. I need not say anything more about this, as I spoke of it so fully when treating of dropsy.

CHYLOUS URINE.

Fibrin sometimes exists in the urine;—not as a deposit from the ureters or bladder, but really as the product of the kidneys. At least, it was so in a case which I saw. I have seen only one case, but that I repeatedly examined; and I found it was the fibrin of chyle. There is the fibrin of *chyle*, as well as the fibrin of *blood*; and it is sometimes found in the urine. The case that I saw was very remarkable. The woman was otherwise in very good health; but soon after she passed urine, a coagulation took place; and there was a quantity of something exactly like *blanc mange*;—as much as a tea-cup full. Occasionally it coagulated, so that she could not make water. I never saw such a case before; but I showed the discharge to Dr. Prout; who examined it, and ascertained that it was chyle. She went on, in this state, for two or three years; and, in the midst of it all, she gave birth to a child;—it seemed to make no difference in that way. I have every reason to believe she is now alive. Dr. Prout has seen six or seven cases since that time. I wished to make some observations upon her; and begged her not to take any food for twenty-four hours;—in order that I might see if it would check the formation. There was this change produced;—the coagulum approached nearer to blood. It had a fine pink colour; and the more she fasted, the more it approached to red;—it was more and more converted into blood. There was no fresh food taken to form fresh chyle; and consequently the chyle became more like blood. Around this coagulum, there was a fluid, which was very serous,—contained a good deal of albumen in solution; and, of course, there was urine; but the fluid scarcely smelt of urine, till it was concentrated. One hundred grains of the fluid, on evaporation, gave only half a grain of urea. Nothing was done in this case; but Dr. Prout told me that, by giving opium constantly, two or three times a day, he had been successful in curing this disease. The quantity of substance was altogether deceptive to the eye for, on evaporating this large coagulum and examining it, there was very little solid matter; and therefore the loss to the system was by no means so great as, at first sight, we must have imagined.

DISCHARGE OF FAT.

Fat has occasionally been found in the urine. When speaking of a discharge of fat from the intestines, I stated that, in some cases mentioned by authors, fat was found in the urine; and in one case, in a lady whom I know, but whom I do not attend, the gentleman under whose care she is assures me, that a large quantity of fat is discharged along with the urine.

URINARY SEDIMENTS.

With regard to concretions, they are of a mixed nature. They may consist merely of the natural constituents of the urine; and may therefore be analogous to those diseases of the solids called *transformations*;—in which things naturally found in the body are present. Or they may be new substances,—such as ought not to exist in the body at all;—being analogous to those which are termed *new formations*, or *non-analogous* changes of structure. I shall now, therefore, speak of those substances which are termed *urinary concretions*; but before entering on that subject, it is necessary to make some general remarks, on the nature of urine and its constituents.

Healthy urine, when it is first made, is acid. It will stain litmus-paper; and, if the bladder be not very retentive, and if persons be not very particular, (as is sometimes the case with old gentlemen), their dress will be stained;—it becomes red on account of the acid in the urine. Chemists say, in general, that the urine is acid when first made; but Dr. Prout contends that it is not pure uric acid, but lithate of amonia, that stains litmus paper red. But the urine sometimes contains *nitric* acid; and you know that, if nitric acid be added to lithic acid, erythric acid is produced. It is of a very fine scarlet hue; and is a substance that does not exist naturally in the urine. If you add to this erythric acid pure ammonia, you then have another change;—a purpurate of ammonia is produced; and if you treat this purpurate with potass, and then again with sulphuric acid, you have a new acid formed,—called purpuric acid; so that erythric and purpuric acid do not exist naturally in the urine, but are the result of other changes. Thus you perceive that, if nitric acid be formed by disease in the urinary secretion, it may give rise to the presence of the purpurates. Purpuric acid may be formed; and then (as there are soda, potash, and ammonia, in the urine) you may have the purpurates of soda, potash, and ammonia; and if these are added to the lithate of ammonia, then the lithate of ammonia which may exist in the urine, becomes of a fine pink or red colour; and you have a pink or red sediment. You see, therefore, that the pink and red sediments are essentially lithate of ammonia, which is formed in excess,—so as to be insoluble at a common temperature; and they are deposited in the urine because they are in excess, or because the *acid* is in excess;—they are superlithates. You know that the lithate of ammonia, and the other lithates, are *white* of themselves; but from the presence of the purpurates, they acquire a *red* or *pink* colour; and if the yellow matter of the urine be absent (as in hectic), then, instead of being *red*, they become *pink*. All this, however, is comparatively unimportant.

In pyrexia, nitric acid appears to be formed in the urine; and the lithates (particularly the lithate of ammonia) are in excess; and in consequence of the excess of lithic acid, or of lithate of ammonia, and the formation of the purpurates by nitric acid, you have a copious red sediment produced; and though it is originally owing to

the nitric acid, yet it is some of the lithates (generally the lithate of ammonia) which has been rendered red by the presence of the purpurates.

Now all this may be produced by the sympathy of the kidney with any other organ that is affected. From mere catarrh,—slight inflammation of the mucous membrane of the air-passages, you will have this effect produced. In fever, and in inflammation, the same occurrence takes place. If there be organic disease, especially of the liver, it has a tendency to produce pink sediment;—that is, it causes an absence of the yellow matter; and consequently the sediment is pink. Very trifling things will produce this state, in some people. A little pie-crust, or pastry, may cause a red or yellow sediment. Anxiety, strong exercise, or (as I have said) the slightest causes or derangement, will give rise to it. Hence Dr. Prout has called this,—"the sediment of health;" though it is seen in disease. He means that it occurs from such slight causes, that it is hardly worth while to consider it as an indication of disease. All is not right, but still it will happen every day; and, indeed, by far the most frequently when the person is in a state which you cannot denominate "indisposition." Generally the redder or the pinker the urine is, the more scanty is its quantity.

This sediment, you are aware, does not appear till the urine cools. The temperature of the urine, when in the body, is sufficient to keep these matters suspended; and therefore it is generally passed clear; and it is not till the fluid is cool, that the sediment appears; and even then, if the person make water a short time afterwards, the heat of the fresh quantity of urine, causes the sediment of the former to be dissolved again; though, of course, a second cooling occurs. For this reason we observe this sediment far more frequently in *cold*, than in *warm* and *hot* weather. In hot weather, though the urine perhaps contains everything necessary for such a deposition, yet it does not produce it; but in cold weather, if it so happen that the urine is not in excess (as it so frequently is),—if we are not chilled,—if we are in a warm room,—if we do not diminish the perspiration, the quantity of urine remains the same as before; and then, on making water, in a cold room, you are almost sure to have this sediment; although, in summer, in the same circumstances, you would not; for the external heat would then be quite sufficient to keep these ingredients in a state of solution.

The sediment, when red, runs by gradual approaches through a light brown, (the colour of ripe hazel-nuts) to absolute white. There is the greatest variety in the shade of colour. Sometimes it is red; sometimes it is reddish; sometimes it is the colour of a hazel-nut; and so on;—fainter and fainter, till the sediment is nearly white, or perhaps quite so. When you see *red* or *pink* sediment, the urine is generally *more* acid than in health; and when it approaches more to *yellow*, it is *less* acid. It shews that there has been less nitric acid; and that less of the purpurates have been formed. A less change, therefore, has been produced on the lithate of ammonia by the pur-

purates; and therefore you have a fainter colour. This is all very intelligible: but it is necessary to shew it, in order that it may be fully understood. In those states of the body in which there happens to be nitric acid formed in excess, you have the purpurates; and the purpurates being present, and united with lithates, you have a red or a pink colour;—just as it may be. In the case of red or pink sediment, therefore, you find the urine acid; but if it so happen that nitric acid is not formed in abundance, then the purpurates are not produced in so much abundance; and therefore they cannot change the colour of the lithates (which is naturally *white*) to a *red* or *pink* hue. Hence, whenever you see this sediment red and high-coloured, you generally find the urine very acid; and in proportion as it is paler,—goes through a faint brown and approaches to white,—in that proportion, generally, is the urine less acid. It may even be deficient in the *natural* quantity of acid; and be rather *alkalescent*. The urine, where there is acid, is high-coloured; but when the sediments are pale, and the urine is not acid, then the urine generally is pale also.

Besides the *nitric* acid, *oxalic* acid has been found in the urine, in the form of a sediment; but it is not a *powdery*, but a *crystallized* one; and is in union with the oxalate of lime. Once only has Dr. Prout seen a powdery sediment;—what he calls "an amorphous uncrystallized sediment of oxalate of lime;" and then it was mixed with ammonia. We shall see, with regard to oxalate of lime, that one calculus consists entirely of it; and the tendency to produce oxalic acid, it is said, has been sometimes traced to eating sorrel; which contains that particular acid. But of that I will speak presently.

If you observe the sediments of the urine to be absolutely white, then they are not the lithate of ammonia, but the phosphate of lime, the phosphate of magnesia, or the phosphate of ammonia, or more than one of these. In this state of things,—when there is this absolutely white sediment of the phosphates,—the urine is *not* acid. On the other hand it is *alkaline*,—it is absolutely alkaline; or it becomes so very soon after it is made. It is rare, certainly, for the urine to be quite alkaline. Sometimes the urine is all but alkaline; and it is no sooner passed, than it emits a strong smell of ammonia. The best test for alkalies is not *turmeric*-paper, but *litmus*-paper which has been exposed to acid. Reddened litmus-paper is the most delicate test; for the smallest quantity of alkali brings back the purple hue. When the sediments are white, and depend upon the phosphates, the urine differs, in other particulars, from the urine made when the sediment depends upon the lithate of ammonia. The urine, instead of being high-coloured, is pale,—with a faint greenish hue; and, instead of being scanty,—as is the case with *acid* urine,—it is generally abundant; and very soon after it is made, it undergoes such a high degree of decomposition, that it becomes very offensive, and smells of ammonia. Still there is one exception to this; and that is, when lithate of soda has been deposited. I have had one

case of this description; and, I suppose, others have had many. There was a white sediment in the urine; but it did not depend upon the phosphates; and therefore the quality of the urine was like that which is seen when there is *red* sediment. The lithate of soda, if not coloured by the purpurates, is perfectly white. It so happened, in this case, that the lithate of soda was deposited pure; but as it was not a phosphate, the urine was not of that quality which occurs when the phosphates are deposited. It was not abundant, but scanty; it was not alkaline soon after it was made, but acid; for it tinged litmus-paper red. One set of sediments consists of lithates deposited in abundance; and they are generally tinged with the purpurates. Another set are always white; and they are phosphates. In one set we have *acid* urine, in the other *alkaline*; namely, where there is an alkaline phosphatic disposition. In one set the urine is *scanty*, in the other it is *abundant*; in one it is *high-coloured*, in the other it is *pale*, and frequently of a reddish hue. If it so happen that the purpurates are not formed, you may have a pure lithate of ammonia; and the deposit will then be *white*;—just as if it were ammonia.

This opposite state of the urine where the phosphates are deposited,—where the urine is abundant, and is disposed to alkalescency,—does not shew an inflammatory state. The *other* secretion of urine shews an inflammatory condition; but this,—where the urine is abundant, is alkalescent, and does not stain litmus-paper,—is connected with an irritable state of the system,—a state of debility. However, these very states run into each other. You will have persons passing one description of urine, with one kind of sediment, and then the other, alternately; and you will have persons verging from one to the other;—so that there is no certainty. Persons are in a sort of mixed transition-state; where matters are much confused. Most probably, they begin with acid urine, and the lithic deposits; and yet they are actually passing into the other condition, which is the worst state of the two. The sediments are sometimes seen to be mixed. You have occasionally, in the sediment, lithic acid, the lithates, and the phosphates also at the same time;—so that the whole state of the patient may be one of transition. You will sometimes find that these conditions alternate; so that you may be very much puzzled, perhaps, in the treatment of the case.

Where the urine is abundant, pale, green, and alkalescent, and the phosphates are deposited, it is observed also that urea is in great abundance; but Dr. Prout considers that it is imperfectly formed;—that it is the urea which gives rise to the abundance of ammonia. The way in which this operates he conceives to be the following. In these cases the urea is secreted in abundance. Urea, you know, is a compound; and being badly formed, it undergoes some change, and affords ammonia. As there is not a correspondent quantity of phosphoric acid, this ammonia precipitates the lime; and then, by uniting with the phosphate of magnesia, a triple salt is formed; which salt is called the *ammoniaco-magnesian phosphate*. This is, of course, a phosphatic sediment; and you may easily know this triple sediment, by its

white glistening particles. You see why the urine, in these cases, is alkalescent. It is because there is such an abundance of imperfect urea,—giving rise to so much ammonia. However, though the abundance of ammonia, from the diseased urea, may be the cause of the deposition of this phosphatic sediment, yet the same effect will be produced from a deficiency of acid in the urine. If there be not sufficient phosphoric and sulphuric acid, the lime will be precipitated; and not only the lime, but likewise the ammonia and magnesia; —so that you have the ammoniaco-magnesian phosphate. Sometimes it is said that an excess of lime is the cause of the mischief. That, however is rare.

Thus you see that the urine may err through an *excess* of acid, of one kind or other; it is generally from nitric; or it may err from a *deficiency* of the acids.

The sediments are sometimes mere powders (called *amorphous*); but sometimes the matters deposited are in a crystalline state. In the latter case they may, in the first place, be red. These red, granular, crystallized sediments (called "crystallized" to distinguish them from powdery ones) are spiculated crystals. You may see them in the urine. There will frequently be red crystals, with numerous spiculæ, at the bottom of the vessel. Some of them, by chance, may be swimming; and some may be sticking at the sides. These are very nearly pure lithic acid. From the great quantity of nitric acid, most probably, the lithic acid is precipitated. Sometimes the lithic acid is absolutely in excess, so that it is not held in solution; and therefore crystals are deposited. But this is not necessarily the case. If you take urine, and add acid to it, the lithic acid will be precipitated; and therefore when you see a crystallized red sediment, with spiculæ, you know that it is nearly pure lithic acid; but it may arise either from the lithic acid being too abundant, or from some acid being present in the urine,—so as to cause precipitation. The *phosphoric* acid will sometimes do this, and sometimes the *sulphuric*; but frequently it is *muriatic* acid; and sometimes it is even said to be *carbonic* acid. It must be a *weak* acid, or an acid of little strength, to precipitate the lithic acid; because any *strong* acid will produce decomposition. The urine,—when you see this spiculated, crystallized, red sediment,—is usually very transparent; and of a fine, reddish colour.

If the crystallized sediment be *white*, it is usually the triple phosphate of magnesia and ammonia; and is called the "ammoniaco-magnesian phosphate. The urine, in this case, is just the same as if the sediment had been in powder. It is alkalescent, abundant, pale, and greenish; and soon becomes ammoniacal, and undergoes decomposition. You may have crystals consisting of oxalate of lime; and then the crystals are of a dark *green* colour; and the urine is found to be acid. But this is a very rare occurrence; and one which I have never seen. The *crystallized* deposits are said never to be found together; while the *powdery* concretions (the *amorphous* deposits) sometimes are.

URINARY CALCULI.

If it happen that the crystals just described are larger, or that more solid matter is heaped together, we give to them the name of *concretions*. It is merely the same thing on a large scale;—perhaps the union of several of these, deposit over deposit; and a great quantity of solid matter. You may be prepared to understand these concretions, from what I have now said respecting sediments;—both powdery, amorphous, and crystalline.

In the first place, we have a concretion which is merely *lithic acid*; and is of a brownish red or fawn colour. Concretions of this kind are sometimes smooth; but sometimes they are tuberculated, rather rough. If you divide them, you find that they consist of concentric laminæ within. If they are broken, instead of being divided with the saw, the fracture is imperfectly crystallized, and of a deep fawn-colour, like the rest. Sometimes they are not in concentric laminæ; but form an amorphous irregular mass, of a pale colour; but when they are pale, they are generally mixed with a little phosphate of lime, or even a little *oxalate*. If you take this calculus, and apply heat to it, it becomes white, and burns away; leaving a minute quantity of white ash, which is generally alkaline. This calculus is quite soluble in potash; and you may precipitate it again by any acid. It descends in the form of a white powder. If you add nitric acid as well as apply the heat, it is dissolved; and, on drying it, you have a fine carmine-colour, which is erythric acid. I before stated, that when *nitric* acid is added to *lithic* acid, a fine scarlet colour is produced; and therefore if you take such a calculus as this, and add strong nitric acid to it, you will have a red colour.

But this calculus is rarely found pure. It is generally mixed with the *lithate of ammonia*; and it is then clay-coloured;—rather paler than the other. It has, however, the same general character. It is sometimes smooth, and sometimes tuberculated; sometimes it has concentric plates, and sometimes it is an amorphous irregular mass; but it is more rarely found in the latter state, than the calculus of pure lithic acid. The most common calculus of this description, is one,—not of pure lithic acid, nor of pure lithate of ammonia,—but a mixture of both; and therefore, whenever you see a calculus of the description I have now mentioned, you cannot say whether the ingredients consist of one or the other; for, in nine cases out of ten, it will be found to be a mixture of both. If lithate of ammonia exist in it, or if it be pure lithate of ammonia, it decrepitates by heat; and if you add potash with the heat, you soon have ammonia given off. It is soluble in the alkaline subcarbonates; whereas a pure lithic acid calculus is not; and therefore you may easily distinguish the one from the other, by chemical means. A calculus, consisting of pure lithate of ammonia, occurs generally before puberty. It is small, and rather uncommon. The most usual thing is to have lithic acid and lithate of ammonia, mixed together. The lithate-of-ammonia calculus is not only continually found mixed with lithic acid, but it is often mixed with oxalate of lime.

The next calculus which is found in acid urine, is *oxalate of lime.* This, for the most part, is very easily known. It is a brown rough calculus, exceedingly hard; and generally exceedingly rugged. From its irregularity on the surface, it is called "a *mulberry*-calculus." Sometimes it is nearly black. If you apply heat to it, a white efflorescence appears upon it. Oxalate of lime no longer remains, but *pure* lime; and this, being alkaline, will stain tumeric-paper. Occasionally this calculus has been found smooth; but it must be of a very small size indeed to be smooth. Generally it is a most formidable-looking calculus;—such as would make one shudder, when you remembered it is formed in the human bladder. It is known by its ruggedness and dark colour.

There is another calculus which exists with acid urine; and it is called *cystic oxide.* It is so very rare that, perhaps, you will never meet with it; but I will describe it. It is of a yellowish-white colour, and smooth externally. Internally, it is a confused, crystalline, glistening mass. In point of size, it is small. If heat be applied, a peculiar odour is emitted; and it is soluble both in acids and in alkalies.

We now pass to the consideration of other calculi; which exist with urine generally deficient in *acidity*, and sometimes bordering very closely on *alkalescency.* These are the phosphates; and the first of which I will speak, is the *phosphate-of-lime* calculus. This is of a pale brown, or of a white colour. It is very smooth and polished; it has regular laminæ, which are very separable from each other. It is rare and small; and it is thought, by Dr. Prout, not to be a true urinary calculus; but to be formed in the prostate gland. It is not fusible by the heat of a blow-pipe; and when you dissolve it, you may precipitate it again. Although this is not dissolvable by heat, yet you may dissolve it in muriatic acid.

We have another phosphate which, unfortunately, is very common. You may know it in a moment. It is the *triple phosphate*;—consisting of phosphoric acid, magnesia, and ammonia. It is white; has no laminæ; and is easily pulverized or broken. This calculus consists of the same substance as the white sand I mentioned. It glistens; and consists of a number of minute, white, sparkling crystals. The surface is uneven;—being covered with minute asperities. If you apply heat or potash to this calculus, ammonia escapes; and therefore your chemical knowledge will enable you to say what it is. If you apply intense heat to it, it will at last melt; but this is effected with great difficulty. It is more soluble in acids, than the phosphate of lime; and you may precipitate it again, in the form of minute shining crystals. In consequence of the addition of ammonia, it is called a *triple* phosphate.

We have another calculus which is very common; but not quite so common as the last of which I spoke. This is a compound of the last calculus with the last but one;—consisting of phosphate of lime, united with the phosphates of magnesia and ammonia. It passes under the name of the *fusible* calculus; because it so easily melts

under the blowpipe. You may know this calculus in a moment, by its breaking under your fingers,—like so much chalk. If you rub it on your sleeve, the coat is immediately dirtied,—as it would be by chalk. It is exceedingly white and very friable. Generally, it is not laminated,—not in plates; but if it be separable into laminæ, you generally find the triple phosphates between the laminæ, in the form of shining crystals. When it is not laminated at all, but is a mass like chalk, it sometimes attains a very large size. It is very soluble in the acids;—particularly diluted *muriatic* acid. It is a calculus which frequently gives the surgeon a good deal of trouble,—coming to pieces when he applies the forceps;—just as any mass of chalk would do. You may easily separate the lime from this calculus. By adding oxalate of ammonia, the lime goes to the bottom; and then, again, the magnesia may be separated by adding pure ammonia.

However, we do not often have this calculus in a form so simple as that I have now mentioned; but, very frequently indeed, we have what is called an *alternating* calculus; that is, a calculus consisting of these various substances in different layers. In by far the greater number of these cases, you will find that the *inner* substances are those which I first mentioned;—lithic acid, or (more properly speaking) a compound of lithic acid and ammonia, or oxalate of lime; and then, in the outer part, you find the phosphates. The layers of these alternating calculi may be very various; but the nucleus,—the internal portion, generally consists of lithic acid, or oxalate of lime. When a patient has a "mulberry-calculus," nature at last throws the phosphates around it. It becomes white externally, and loses a great portion of its roughness; so that the patient does not suffer so much as before. The external crust generally consists of a "fusible calculus." Sometimes you have laminæ of all the three ingredients; but still the external crusts generally consist of the phosphates. When calculi are thickened in this way, they are often very large. As to the *chemical* qualities, they depend upon the layer you examine. If you inspect the *outer* layer, you find all the characters of the phosphates; and *within* there are all the characters of lithic acid and lithate of ammonia.

Then, again, we have another compound calculus; in which the materials, instead of being in alternating layers, are all mixed together. A mass of this kind generally consists of lithate of ammonia and the phosphates; and, of course, the colour will vary with the composition. Accordingly as lithic acid predominates, or the phosphates, so will the calculus incline to a *clay* colour, or to a *white* colour; and the proportions are quite indeterminable. A *mixed* calculus, of this description, is generally very hard;—seldom laminated, and seldom large. There is another calculus, called the *carbonate of lime* calculus; because it consists of pure carbonate of lime. It is very rare, and very friable. It has all the characters of chalk; and effervesces with the acids.

Then there is an eleventh calculus; which is so very rare, that it

has been seen only once. It is called *xanthic oxide*. The substance of this is very peculiar. By the addition of nitric acid it becomes yellow.

There are some concretions of the bladder, which have turned out to be nothing more than fibrin.

PROSTATIC CALCULUS.

Besides these *vesical* calculi, we have calculi in the prostate gland. They are found in two situations;—first, in the *natural cavities* of the gland; and then they are of a yellowish brown colour, and more or less round and small. Sometimes, I believe, these come from the kidney. I have passed thousands of these at different times;—about the size of pins' heads. I have collected some, and shewn them to Dr. Prout; who says they came from the prostate. But calculi are sometimes found in an *abscess* of the prostate; and these are much larger and highly polished. They are chiefly phosphate of lime; and Dr. Prout believes that the phosphate-of-lime calculus, found in the bladder, is in reality a *prostatic* calculus.

CALCULOUS DIATHESES.

It appears that there are four elementary kinds of calculi, and four distinct calculous dispositions; to which dispositions Dr. Prout gives the name of *diatheses* (from διατιθημι, *to dispose*). In the first place, there is the diathesis to form *lithic acid*, its compound (lithate of ammonia), and a mixture of the two. Now this is the most common calculus we have. Nearly all the calculi taken from children, if they have not been allowed to remain long, consist of lithic acid, or its compounds, or a mixture of the two; and in the majority of calculi taken from people, of whatever age, you find that it forms the nucleus within. Then there is a disposition to produce *oxalate of lime*; and that appears to be a distinct diathesis. Then there is a disposition to form *cystic oxide*; but this is very rare. Then there is a disposition to form the various *phosphates* which I have mentioned. This last succeeds to the others. It is usually after the three first diatheses have ceased, that the disposition to form the phosphates comes on.

So common is the disposition to produce the *lithic-acid* calculus, that it is said to predominate in rather more than one-third of all the calculi that are examined; and it is by far the most frequent nucleus of all calculi. At least two-thirds originate from it in the first instance. Those which are of a deep fawn-colour, are well laminated, and have quite a crystalline fracture, are nearly pure lithic acid; in fact, it is red crystallized gravel. If, with this diathesis, the calculus is of a pale-brown or clay-colour, with an earthy fracture, then it is a compound of lithic acid and ammonia; and generally there is a little mixture of the phosphates, and even a little oxalate of lime; and the more there is of the phosphates and the lithate of ammonia, instead of lithic acid, the paler the calculus becomes. The rarest of these calculi is the pure *lithate of ammonia*. The "*mul-*

berry calculus" is found to *constitute* rather less than one-*seventh* of all the calculi which are examined; but it is *contained* in about one-*fourth* of all the calculi that occur. As to the *cystic-oxide* calculus, so rare is it that, of two hundred and seventy-four calculi which were examined, only one was found to be of this description; and in three collections out of five, none were found. The *phosphates* constitute about one-fourth of the calculi; and one-half of this one-fourth are the *mixed* phosphates;—that is to say, a mixture of the different phosphates. But this estimate of one-fourth is not very accurate; and for this reason;—it has been taken from the *external* appearance of the calculi; whereas, if these had all been sawn through, it is most likely that, *within*, a number of other ingredients would have appeared. The *alternating* calculi (those which consist of a layer of different substances,—the lithate of ammonia, the oxalate of lime, and the phosphates alternately) form a very large proportion. In these alternating calculi, we sometimes see lithic acid and its compounds externally; and perhaps a foreign body for a nucleus. We see, *within*, alternations of lithic acid and its compounds, and a mulberry-calculus *without*;—that is very common. We see alternations of lithic acid within, and the phosphates without. We see alternations of the lithic-acid calculus within, then the "mulberry-calculus," and the phosphates without. Again, we see alternations of the "mulberry-calculus" within, and lithic acid and the phosphates without. When, however, these alternating calculi are found, the phosphates exist externally; and therefore it appears that the disposition to form phosphatic calculi, does not precede the disposition to form lithic acid calculi, or oxalate of lime. It appears that the disposition to form the phosphates, either takes place originally, or follows the disposition to form the oxalate of lime, or lithic-acid calculus; but it is not succeeded by any other diathesis. This very interesting and very remarkable fact, was noticed by Sir Gilbert Blane, in 1811; in a paper published in the "Transactions of a Society for the Diffusion of Useful Knowledge." He states that lithic acid is generally the nucleus in calculi; and that the other dispositions are merely the result of irritation. I am not aware that this statement of Sir G. Blane's was attended to for some time; but it has now, by very extensive observations, been proved to be correct. Dr. Prout says, that he never met with one patient in whom the phosphatic disposition was decidedly followed by any other. It usually occurs when irritation takes place.

The disposition to form lithic acid, evidently appears to reside in the *kidney*; for these calculi are seen in that organ. Indeed, there is no reason whatever for believing that this description of calculus is formed in the *bladder*. It appears to be truly a *renal* calculus. If this diathesis be not very intense, you have merely an amorphous sediment;—such as we all have, at times; and if it be not very abundant, there is no danger. Some people frighten themselves about it; but, unless the quantity be very great, there is no occasion for alarm;—especially if the sediment does not appear when the urine

is first made. If it be so abundant as to be deposited before the urine cools,—if it come from the bladder in the form of powder, then there may be danger; and if it not only occurs when the urine is first made, and is warm, but takes place constantly, then, I believe, the individual is almost sure at last to have gravel or stone;—that is to say, he will pass concretions; or have a concretion so large, that it will not pass. With respect to the lithic-acid sediment, there is more danger in proportion as it becomes paler. When it is of a bright *red* colour, there is not much occasion for alarm; but when it is *white*, there is some degree of danger; because it shews a disposition to deposit the phosphates. I do not say that it *always* shews danger; because occasionally, when it is white, it is merely lithate of ammonia; and it is white because it is not tinged with the colouring matter, in the way I mentioned before. Very frequently, however, the intensity of it arises from the phosphates being deposited; and when that is the case, there is considerable danger.

Some people pass, not merely a powdery sediment, but a mixture of amorphous and crystallized sediment. Some people will even pass crystals with very little irritation; but if irritation be produced by the sediment, then there is generally a mixture of amorphous and crystallized sediment; and when the irritation is very great, it is generally because a large quantity is passed in both these forms. In these circumstances, there is generally more or less pain in the kidney; irritation about the neck of the bladder; a frequent desire to make water; and more or less feverishness. The urine is acid and scanty; it has a high specific gravity. You will find persons complain of these symptoms, from time to time; and then they will discharge a large quantity of red or reddish sediment. The urine is very acid; and you should always test it. This state of things frequently comes on in persons who have a calculus already in the bladder. Sometimes a calculus is formed in the kidney, and may remain there; and give the patient no trouble. A person may have a stone formed in the kidney, without being aware of it; and you may be surprised to find it there after death. Sometimes it will only cause an aching pain in the loins; and will not shorten life. But occasionally these calculi produce very great mischief. No doubt they continually pass in the form of minute concretions; and the patient is not at all aware of it; and they will lodge in the bladder, and there grow to the size of which they are found. Sometimes they pass from the kidney, after having obtained a size so large as to give great pain, as they pass through the ureter. From their attempt to leave the kidney, there is pain in the back, attended with vomiting; and perhaps you have a great degree of feverishness. Inflammation may be set up, or it may not; and then, after a time, all these symptoms cease, perhaps suddenly; and in a day or two, if the stone be very large, you have signs of a calculus in the bladder.

The infundibula of the kidney are sometimes filled with these calculi. You will see them sticking there; and sometimes the kidney will become blocked up with them. The pelvis is sometimes filled

with them; the infundibula become greatly distended; and sometimes the ureter is blocked up with them;—so that the pelvis of the kidney is distended into a mere bag. It is said that, in the Museum of the College of Surgeons, there is a calculus, weighing seven ounces and a half, which was taken from a kidney, and which caused no symptoms during life. This is analogous to what I stated with regard to the gall-bladder; where a large number of stones will sometimes exist, without being productive of any symptoms. These lithic-acid calculi are continually found in the kidney; and are of all sizes. It is probable that, in all the instances where they are found in the bladder, they have descended from the kidney.

Lithic-acid calculi (using the term generically) sometimes occur in great numbers. No fewer than two thousand have been voided, by one individual, in the space of two years; and one hundred and twenty have been known to come away in three days. It is the calculus which, of all, gives the least irritation. Children and dyspeptic individuals are most subject to that state of body, in which there is a disposition to form these calculi. The disposition appears to be less between puberty and forty years of age, than before. There is certainly sometimes an hereditary tendency to it; for it occurs in members of the same family,—descendants of each other. It is said to have occurred frequently in those who have cutaneous complaints; but cutaneous diseases are so very common, that I do not know whether the examples are sufficiently numerous, to authorize us in supposing that there is any connexion between the two. Something appears to depend upon local situation; for some places are remarkable for the abundance of persons with this sort of calculus; but it is not known in what the peculiarity consists. Undoubtedly there is some connexion with a gouty disposition. Persons disposed to gout, frequently become the subjects of this sort of calculus, and this kind of deposition in the urine. Excess in eating or drinking, is always mentioned among the causes; and so likewise is indolence.

As to the *treatment* of the disposition to form this calculus, and this kind of sediment, it consists in antiphlogistic measures; for this state of body is certainly, for the most part, inflammatory. An individual so circumstanced, should take very little animal food;—sometimes, perhaps, none at all. In many cases, the latter restriction may be necessary. At any rate, animal food should be taken in great moderation; and equal moderation is required in eating altogether. In general, it is necessary to abstain from wine, spirits, and strong malt-liquors; though *mild* malt-liquors may be admissible. It is not merely necessary to abstain from Rhenish wine and claret; but from all strong wines, and every thing that is sour. It is necessary to avoid vinegar, sorrel, oranges, and lemons;—in short, every thing that is acid. It is likewise necessary that the patient should be moderate in the exercise he takes; and that he should keep an open state of the bowels. With regard to *medicine*, colchicum is found to be beneficial; together with light preparations of mercury;—mercury in a moderate quantity;—so as not to debilitate the frame; but

to keep down, as much as possible, an inflammatory condition. In connexion with colchicum and mercury, neutral salts will be very proper. Alkalies are advisable here,—particularly magnesia;—both on account of its being an alkali, and from the tendency it has to open the bowels. A saline draught is an excellent mode of giving an alkali; because, although you thus give a neutral salt, yet it contains a vegetable acid; and that is always decomposed within, so that you have the benefit of the alkali which was combined with it. For this fact we are indebted to Sir Gilbert Blane. He was the first who pointed out the impropriety of giving saline draughts, where an alkali was not required; and the advantage attendant upon their exhibition when it was. Dr. Prout, and others who are best able to give an opinion upon it, declare that this is the case; and they frequently give a saline draught, for the purpose of administering an alkali. It is judged advisable, in these cases, to take care that the water which the patient drinks be not hard,—does not contain salts or lime; although water, for the most part, is one of the best beverages which people, in these circumstances, can take. I stated that neutral salts should be given from time to time. By neutral salts, I mean tartrate of potash, and the like. Patients, in this condition, sometimes find great relief from the abundant discharge of lithic acid. You will sometimes hear patients say, that they have discharged a quantity of powder, like fuller's-earth. It is certainly true that, in this state, a vast secretion of lithic acid, or lithate of ammonia, occasionally takes place in the kidney; and then the irritation is altogether relieved. It comes on in fits;—just like the gout.

Some have attempted to bring on a secretion of this earth, by artificial means. For this purpose, some give turpentine and opium, in small doses; and some give onions and leeks steeped in gin, wild carrot, and other herbs. Dr. Prout says, that he has seen great benefit produced by these substances. I mentioned when speaking of diabetes, that opium has undoubtedly the power of increasing the quantity of lithic acid; and therefore it has been employed where a copious discharge of lithic acid was required all at once;—a *liberation*, if I may so say, of the sediment. But a purgative should be given in conjunction with the opium; because, although the latter may do partial good by exciting a discharge of lithic acid, yet it may do harm, by confining the bowels;—to which state they are much disposed. In such a case as this, if the patient be very bad indeed,—if he have violent pain in the kidney, great feverishness, pain down the ureter, and about the neck of the bladder,—you must treat it as nephritis and cystitis; particularly by cupping him on the loins. You will find it serviceable to put him in a hot-bath, to purge him well, and to give him colchicum, alkalies, and opium.

In cases where the disposition is to form *oxalate-of-lime*, or "mulberry-calculi," the urine is likewise acid. A state of the system, similar to that last described, takes place; and a similar mode of treatment is required. The "mulberry-calculus," like the lithic acid, occurs in both sexes; and at all ages up to fifty. It is about

fifty that it is most frequently seen; but it is, I believe, never formed after sixty years of age. The lithic-acid calculus and its compounds, occur in persons who are very dyspeptic; and who are disposed to be feverish and irritable; but the oxalate of lime, or the "mulberry-calculus," is continually produced in persons who have nothing else the matter with them; and when produced, it may be discharged. The lithic-acid calculus and its compounds (as I stated) have been formed to the amount of two thousand in one individual;—of course, of all sizes; but the oxalate-of-lime or "mulberry-calculus," seldom occurs more than once in a patient's life; or if it does return,—that is to say, if another be produced,—it is generally after a very long interval. The urine, in this state of things, is pretty good, and remarkably clear. The *amorphous* sediment of the oxalate-of-lime, is a very rare thing indeed; and as to the *crystallized* sediment of oxalate of lime, that is still more rare. A calculus of this description, often acquires an immense size in the bladder, and it does not appear to be produced accidentally. The lithic-acid or phosphatic calculus, will be produced accidentally;—when there is a clot of blood, or a foreign substance has been introduced into the bladder; but this depends upon a peculiar state of the system, which is not understood;—a peculiar diathesis, which appears unconnected with external circumstances. It sometimes *follows* the deposit of a lithic-acid calculus, and is sometimes *succeeded* by it; but nothing is more common than to find it alone. It sometimes happens, that oxalic acid ceases to be formed; and lithic acid is produced in abundance; and then the deposition in the external part of the calculus is lithate of ammonia, instead of oxalate of lime. I have myself known several persons discharge a calculus of this kind. They have been perfectly well; but have suddenly been seized with violent pain in the kidney; which has continued some days,—perhaps only for some hours, and sometimes only a few *minutes*. The pain has shot down towards the bladder, and then ceased; and after a few days, in passing their urine, they have been surprised by something making a noise in the *pot-de-chambre*. Sometimes there has been violent irritation; with all the ordinary symptoms of a stone in the bladder. The stone has escaped; and then they have been perfectly well, and have had no return. I know several persons, in whom this happened many years ago; and who, ever since, have been in perfect health.

The *treatment* here, as the urine is acid, is exactly the same as for the lithic-acid diathesis;—that is to say, if there be any inflammatory state of the system, you must suppress it by the ordinary antiphlogistic means. If no inflammatory state can be discovered, still you must put the patient on an antiphlogistic plan. Dr. Prout suggests the propriety of changing the *oxalic*-acid diathesis for that of the *lithic*-acid, by exhibiting muriatic acid. If you give acids, lithic-acid is produced; and he says you should endeavour to produce the lithic-acid diathesis; which, he states, may be done by muriatic acid. It is merely a suggestion; and I do not know that it is founded upon practical experience.

As to the *cystic-oxide* diathesis, the calculus itself is very peculiar; and the state of the body in which it is formed, is not known. It is generally supposed that this calculus originates in the kidney. The *treatment* of the case, would depend upon the circumstance of the urine being *acid* or being *alkaline*. If it be acid, you must treat it in the way I have mentioned; if it be alkaline, then you must treat it as I shall hereafter mention. Dr. Prout thinks that, in this diathesis, the prognosis is unfavourable; for, in most instances, the kidney has been found diseased; and, in others, there has been an inveterate hereditary tendency to disease of the urinary organs. It appears to be a very exclusive diathesis; for it is found with no other deposition in the urine. There is no other calculous matter *within* this, as a nucleus, or *without* it;—except the phosphates, which are the effect of irritation. The calculus is sometimes incrusted with the phosphates; but that is the result of mere irritation,—not of a disposition to disease.

We have now to consider a far worse state of the system;—that in which the *phosphates* are deposited; and which has been called "the *phosphatic*" or "the *earthy* diathesis." Here everything is the reverse of what I stated to be the case, where the tendency is to a lithic-acid or oxalate-of-lime calculus. The urine is not scanty and high-coloured, but copious and pale; and often it is greenish. On looking at the urine, you may tell what is the state of the parts. You may say that the individual has a phosphatic calculus in the bladder, or is depositing phosphatic sediment. The urine is of lower specific gravity, than in the cases I have already considered; and lower than it is naturally. It is in these cases that the urine very soon putrefies. Sometimes you cannot keep it a day before it is quite putrid;—smelling strongly of ammonia. Frequently, at the top of it, you have an irridescent and white pellicle; which consists of the phosphates, with (I presume) a little mucus. The sediment may be either pulverulent or amorphous;—being a mixture of the phosphate of lime and triple phosphates; or it is crystallized; and then you have the triple phosphates only,—in white glistening crystals. You know that the two chief calculi found in the bladder, are the triple phosphate (the ammoniaco-magnesian phosphate), and that with a mixture of the phosphate of lime; and in that case it is white, is not crystallized, is friable, leaves a white mark on anything it is rubbed against, and is very fusible.

This phosphatic disposition, and these phosphatic concretions, are very rarely original. They generally occur subsequently to the formation of other calculi; and subsequently, in general, to the lithic-acid or oxalate-of-lime diathesis. The way in which it usually takes place, is this;—the red sediment becomes a fainter red; and, from the phosphates being more and more formed, it becomes paler and paler, till you have a clay-colour; and then, at last, the phosphates only are formed;—the lithic acid and lithate of ammonia being no longer deposited. The urine then becomes more abundant,—does not shew such strong signs of acidity; and, at last, there is no acidity

whatever. On the contrary, perhaps, it is even alkalescent; though that is rare when it is first made. Ultimately, however, (as I have already said), it very soon putrifies; and in that case it is very alkalescent;—affecting turmeric-paper a short time after it is voided, and depositing spiculæ of the triple phosphates.

The two sediments of the phosphates,—the sparkling glistening crystals, and that in which there are no glistening crystals, but with which the phosphate of lime is mixed,—sometimes alternate. The same individual will, for a day, or a week, or perhaps a fortnight, deposit glistening crystals of the triple phosphates; and then, at other times, those which do not glisten at all; and sometimes the latter alternate with lithic acid; but then the lithic acid is very pale, —verging to the phosphates; and sometimes, before it gives way to them, there is an alternation of the two. If there be a great deal of crystallized phosphate, then the urine is very alkalescent. The urea is very copious; and crystals are sometimes formed, before the urine is discharged from the bladder. This deposition usually takes place after the urine is made; but, in bad cases, it will take place before it is voided; and the instant the urine is made, the deposition subsides to the bottom of the vessel.

In the second phosphatic sediment,—that in which there is a mixture of the triple phosphates and the phosphate of lime,—although the symptoms are similar, as well as the state of the urine, yet they are both far worse than in the first state. In this condition of the body there is no inflammatory state. There are no marks of inflammation; but there is a morbid irritability. There is a bad expression of countenance;—shewing distress,—shewing something wrong in the system. The patient is generally sallow and languid; and experiences pain in the loins. There is generally more or less dyspepsia, and some abdominal derangement. Very frequently, there is a want of sexual power and desire; and when a person complains of that, it is always right to examine the urine. In many cases, you will find diabetes; in many others, you will find an excess of urea; and in others, again, you will find, not only an excess of urea, but likewise a deposition of the triple phosphates. The urine will vary on different days, and at different times on the same day;—being at times copious, and at others less so.

Many of these cases have arisen from an injury of the loins; and they arise, too, from the depressing passions,—from anything that exhausts the vital powers. In some instances, they appear to have arisen from masturbation, or from excessive venery. Any local irritation, whether in the bladder or in the urethra, will produce them; and therefore this diathesis is rarely found in the kidneys. You will generally find no marks of disease in the kidney; but usually in the bladder. When a lithic-acid calculus descends to the bladder, it usually produces irritation; and then the phosphates are produced. The bladder is often diseased, from various causes; and frequently it is inflamed;—so that these calculi appear to be far more frequently formed in the *bladder*, than anywhere else. They have been formed

from an irritation in the urethra, reaching to the bladder; but generally it is an irritation of the bladder itself that produces them. Urine having this deposition, has continually been seen after an injury to the spine. After these injuries, therefore, and in disease of the spine independent of mechanical violence, surgeons expect to find such urine; and, on examination, they generally do. Stricture of the urethra will induce this description of urine. It seems not only to act by irritating the *bladder*, but it also affects the *kidneys*;—causing them to give origin to urine imperfectly acidified. Great irritation,—whether it occurs in the bladder or in the urethra,—gives a tendency in the kidneys to produce urine with a deficiency of acid; and if it be deficient of acid, the phosphates are usually deposited in the way I before mentioned;—from the decomposition of the urea, and the production of other things.

In this diathesis, you must not keep the patient low, and bleed him. On the contrary, you must give him meat, if he will bear it; and even allow malt-liquors. Although, perhaps, wine may, in general, be too irritating, yet acescent wine is good. The tendency is to alkalescency; and, if it do not disagree with the stomach and intestines, wine should be taken. Acids themselves are proper;—especially *citric* and *muriatic* acid. Mercury acts here as a poison. If you give mercury, in nine cases out of ten you will find the urine become more alkalescent, the patient's pulse will become irritable, and all the symptoms about the urinary organs will be aggravated. Opium is required freely,—in order to lessen the irritation. The sulphate of quinine, or a decoction of bark, has been exhibited with the greatest advantage; and iron is frequently useful, though occasionally it is too stimulating. These things must be exhibited with regard to individual cases, as well as on general principles. Saline purgatives, of whatever kind, are improper; for as they consist of an alkaline earth and a vegetable acid, and the latter is decomposed in the system, you are actually giving an alkali; which makes things worse. Saline substances produce great irritation;—such as cannot be borne. It is best to give mild aperients (such as confectio senna, and castor oil), in moderate doses; so as not to irritate, but merely to prevent an accumulation in the intestines. A small quantity of muriatic acid will be found sufficient;—five drops will produce a specific action on the urine; but ten or twenty may sometimes be required. Instead of bleeding and mercury, opium is the great remedy here. You will find no difficulty in ascertaining whether one particular treatment is proper or not; for the state of the urine will always determine that point. It is always right to employ litmus-paper, stained red; for, in proportion as the urine is alkalescent, it will restore the original colour; and (as I mentioned before) it constitutes a far more delicate test than turmeric-paper.

It is the state of the urine which determines all the treatment. Whether there are signs of a calculus in the kidney or not,—whether there are signs of a calculus in the *bladder* or not,—whether there are any of the sediments which I have now mentioned or not,—

whether the person is going to be lithotomized, or has been already submitted to that operation,—the urine should be carefully examined; for you have to treat the case in all these circumstances. Where a calculus has been removed, you still have to remedy the condition of the system which gave rise to it; because that condition does not cease on the extraction of the stone. You should examine the urine which is passed first in the morning; because that is the least liable to be influenced by accidental circumstances, and therefore the most likely to shew the actual state of the system. It should be put away for twenty-four hours;—in order that you may make a perfect examination. In many cases, you may ascertain the point immediately; but the urine should be allowed to remain and cool; and the sediment, if there be any formed, will then be deposited. This kind of treatment is continually required after lithotomy, or the removal of stones in any other way; and, from the want of making a careful distinction,—from the habit of giving alkalies when there is any thing the matter with the urinary organs, infinite mischief is done. It is far better for nothing to be done, than to do something wrong; and mistakes, till very lately, were made every day,—almost every hour, in the treatment of these cases.

LITHIASIS.

Supposing that there is a stone in the bladder,—an affection which is called *lithiasis* (from λιθος, *a stone*),—the symptoms that are produced are usually a particular pain at the end of the penis;—a pain which the patient describes as a *benumbing* pain, and which is increased upon exertion. This pain makes the patient pinch the penis as hard as he can; and if he feel a sudden call to make water, he usually puts his hand to the end of the penis; and children are in the habit of pulling the prepuce. There is a frequent desire to make water, and the stream suddenly stops;—the desire to make water, however, being still urgent. Sometimes a change of posture will cause the urine to flow again. Sometimes the urine, instead of suddenly stopping, will come away drop by drop;—the discharge being attended with great pain, and perhaps with blood. There is pain in the bladder itself, especially on motion; and likewise pain and tenesmus on evacuating the intestines. If the calculus be large, or very rough, there is pain in the neck of the bladder, pain and numbness of the testis of the same side, and pain of the inner part of the thigh, along the course of the anterior crural nerve, and sometimes down to the foot, so that there is actually pain in the sole of the foot. All these symptoms are rendered worse by exercise.

Pain at the end of the penis, pain increased on motion, and increased whenever the desire to make water comes on, a frequent desire to pass urine, a voiding of it drop by drop, tenesmus, and the presence of blood in the urine,—all these symptoms may occur when there is no stone whatever. In the course of my life I have had every one of these symptoms two or three times over, from mere inflammation about the neck of the bladder. The sudden stoppage

of the stream, is the sign most to be depended upon. Disease of the prostate, and inflammation at the neck of the bladder, will cause many of the other symptoms. Dr. Heberden says that the pain on voiding the urine is felt *after* making water, in the case of *stone in the bladder*; and worse *before* passing it, in the case of *diseased prostate*; and that in the latter case it is not increased on motion. I believe this is a general fact. The obvious reason why the pain is increased on motion, in the case of a stone in the bladder, is this. The stone is moveable, and may therefore come forcibly in contact with different parts of the organ, by motion; whereas the prostate is fixed. However, the prostate is rarely diseased except in the case of old men. Dr. Heberden says, that even pain and swelling of the testes are sometimes observed in disease of the prostate. But you may always ascertain whether the prostate is diseased, by passing your finger up the rectum, and observing whether it is enlarged; and the certain way of ascertaining whether there is a stone in the bladder, is to sound the patient. In the latter case there is frequently secreted a large quantity of ropy mucus; which you may draw out to a considerable length, and which subsides to the bottom of the vessel, in the form of a white tenacious mass. Occasionally, a small fragment of a calculus comes away; and when all the symptoms have become violent,—whatever deposition there formerly was in the urine,—whatever was the diathesis before, it now becomes phosphatic. The urine becomes pale and copious; it loses its acidity, and has great alkalescency; and if there be any deposition at all, it consists of the phosphates. In this state of things, the agony becomes constant; the patient becomes emaciated; and death ensues. The phosphatic diathesis and the sufferings are proportionate to each other. After death, the bladder is found to be diseased. The mucous membrane becomes diseased; the muscular fibres are enlarged; and perhaps even the kidneys are affected.

This state of things may generally be prevented by the removal of the stone by a surgical operation; and sometimes it fortunately ceases, from a sac being formed in the bladder. The muscular fibres give way, and the inner coat protrudes between them. Not that the muscular fibres *rupture*; but the inner coat gets between the bundle of fibres; and you see externally, on one part of the bladder, a small protuberance;—consisting simply of mucous membrane internally, and peritoneum externally. Sometimes, if the calculus be rough, the symptoms are diminished by the deposition of the phosphates. Although the phosphates are in general produced by irritation, yet they fill up the interstices between the prominences of the calculus, and so render it smoother than it was before; and, in this way, the symptoms are sometimes alleviated.

But it is to be remembered that, although a stone *may* produce all these symptoms, yet it does not *necessarily* give rise to them. If the calculus consist of lithic acid, it may be small and quite smooth; and then it may give very little trouble. Indeed, such a calculus has been found after death, when its presence was not at all suspected.

The health is sometimes very good, in such cases; and if the health be fair, and the patient does nothing calculated to injure him, a calculus of that kind may not increase. When a person, on being sounded is known to have a calculus in the bladder, yet it may go on for many years without any increase;—provided he does nothing unfavourable;—that is to say, does not commit any excess,—does not increase the feverishness;—provided he adopts a moderate antiphlogistic plan. Dr. Prout knew a case, in which the presence of a stone in the bladder was ascertained by sounding; and, five or six years afterwards, at the time he mentioned it to me, the patient experienced little or no trouble from it; and frequently, for weeks together, the patient forgot that he had a stone in the bladder, or any thing the matter with him. But the case had been well managed; and the patient had been put on a moderate antiphlogistic regimen,—such as I before mentioned. Dr. Prout also mentioned to me, that he knew a case where four renal calculi existed in the bladder five months, without producing any severe symptoms; and then a little irritation occurred at the neck of the bladder, which led to their removal; and yet one of them was nearly an inch in length. These, however, were lithic-acid calculi. The *oxalate-of-lime* calculus (if it be of any size) causes extreme suffering, and so also does the *phosphatic;* and for them an operation is indispensable. No regimen will answer the purpose here, provided things have not gone so far, that a surgeon would not listen to the operation. Of course, the *nature* of the operation must be determined by the surgeon;—whether it is to be the removal of the stone by cutting, or its reduction within the bladder, or dilatation of the urethra, or any other plan.

You know that, in the case of the male, calculi of really considerable size are sometimes discharged; and instruments have been formed to dilate the urethra;—so as to bring them away without any incision; but these are lithic-acid calculi. Nature very frequently discharges them herself. This occurrence takes place far more frequently in the *female,* however, than in the *male*; and much larger calculi have been brought away, both by nature and by artificial dilatation. One which weighed as much as twelve ounces has been discharged by a female. These are very extreme cases. On account of the shortness of the urethra, it is very common for females to pass calculi, by an effort of nature; and it does not appear that females are, by any means, so subject to the complaint as males.

When the suffering has been very great, and an operation has at last been performed, it is generally found that the calculus is, externally, of a phosphatic kind; but an entire phosphatic calculus is rarely seen. In this state of things (when the phosphatic diathesis exists) the kidney is at first affected only functionally. From irritation of the urinary organs, it secretes morbid urine; urine which has an excess of urea, together with a tendency to a phosphatic deposition; but, at last, actual structural disease of the kidney takes place. If the kidney could be preserved in a state of functional health,—if it could be made to secrete proper urine, it is probable

that, although a stone exists in the bladder, it would not increase, even around an accidental nucleus. But the accidental nucleus produces irritation; that irritation is communicated to the kidney; the kidney secretes morbid urine; from this morbid urine deposition takes place; and so the calculus increases. The moment the urine becomes unhealthy, then a deposit takes place; and the mischief goes on increasing. Frequently, at its origin, the disease does not depend upon any external circumstance; but there is a real disposition to these morbid deposits; which disposition gives rise to them, and they go on increasing, till a calculus is formed. But if, by chance, any thing gets into the bladder,—a piece of bougie or a drop of blood,—so as to form a nucleus,—this, by inducing irritation, will cause calculus to form round it. If, by art, we could keep the urine healthy, it is supposed that a calculus would not be formed;—that the nucleus would not serve for any thing to collect around.

It does not appear that a calculus goes on increasing regularly. The urine is not always equally morbid; the irritation is not always equally felt; and external circumstances are not always equally unfavourable. The patient neglects himself, from time to time; or some unfortunate occurrence takes place. In short, the urine is not always in the same morbid condition; and therefore the calculus does not go on regularly increasing at the same rate. Sometimes a calculus has been known to increase very much, and the state of the urine to become more and more morbid; and then, again, the process has been exceedingly slow. There is another reason to make us suppose, that the deposition is not constant. Many calculi have a laminated structure; and between the laminæ they appear to have suffered some diminution. There is a space there; and they frequently look as if they were worn by water moving around them. The occurrence of separate laminæ, indeed, is considered to prove their irregular deposition.

It is not only where there is great suffering, or where the urine has become phosphatic, that an operation is proper, provided the case is not too far gone; but if the patient be below puberty,—even although the sediment is not phosphatic; but is red, and consists of lithic-acid and lithate of ammonia,—then it is considered that the calculus should be removed. If the individual be below puberty, there are five thousand chances to one of the calculus increasing, and giving further trouble; and though the patient may not be suffering much, it is generally best to extract it. Lithotomy is considered to be less dangerous in children, than in adults. It was found at Norwich to be four times less so. Generally speaking, the ratio of mortality, from lithotomy, is about one in seven and three-quarters; but in Norwich it is said to be less than any where else; so that, for forty years, Dr. Marcet found that the average of mortality there was but one in eleven and three-eighths;—before puberty one in eighteen; and after that period one in four and three-quarters. Nearly one-half of the cases of stone in the bladder are found to occur before puberty; and then there is an increased number again after forty; and but one

female was affected with stone in the bladder, for twenty-three males. Some ascribe this to the quiet habits of females,—to the circumstance of their not being subject to laborious exercise; and others ascribe it to the shortness of the urethra. The latter circumstance must have great influence; but, in all probability, there is less disposition in them to the disease.

These are the only considerations for the *medical* practitioner. With regard to the performance of the operation, of course I have nothing to do with it. All that we have to give an opinion on, is the condition of the urine;—taking into consideration, when contemplating an operation, the suffering and the age of the patient.

CYSTITIS.

The urinary bladder is, of course, subject to inflammation; and this disease is called *cystitis*;—"cystis,"—*the bladder* (from κυστις, *a bag*), and "itis,"—*inflammation*. The symptoms are a burning and throbbing pain in the hypogastrium; tenderness on pressure; a very frequent desire to make water; and a most horrid pain at the neck of the bladder, while the urine is passing;—so that the patient, perhaps, can only void it on his knees. The urine is made in a very small quantity, perhaps every ten minutes; and it is often high coloured,—perhaps bloody. There is also tenesmus. This affection is induced by turpentine, cantharides, and other things which peculiarly irritate the urinary organs; but more particularly by gonorrhœa. The inflammation of the urethra spreads inwards; and then you have inflammation of the bladder. The treatment is simple enough; but it requires to be put into practice vigorously.

CYSTORRHŒA.

The bladder, however, is subject to *chronic* inflammation; and it is still more subject to an affection of the mucous surface; in which affection there is a great discharge of ropy mucus,—such as occurs when a calculus exists in this part,—and causes great suffering. There is not only this quantity of ropy mucus secreted; but the mucous membrane itself becomes hypertrophied. As much as several pints of this ropy mucus have been known to be discharged in a day; but it is very common indeed for a pint to be discharged. It subsides to the bottom of the vessel, and is quite white. It sometimes blocks up the urethra; so that a little difficulty is experienced, from time to time, in making water; and at last it is really purulent. This affection is called *cystorrhœa* (from κυστις, *the bladder*, and ρεω, *to flow*). After death, if the disease prove fatal, there is frequently a thickening of the mucous membrane to a great amount. The muscular fibres are seen distinctly; and, in some parts of the bladder, are very much developed. It would seem, indeed, that those muscular fibres described by Sir Charles Bell, and which run from the extremities of the ureters, become hypertrophied;—so that, at the orifice of the bladder, you see a triangle; the sides of which run from the mouth of one ureter, to that of the other, and from both to

the mouth of the other. You sometimes pass your finger down half an inch;—so great is the development.

The treatment of a case of this kind must be antiphlogistic;—so far as the patient's strength will allow of it. The frequent application of leeches is proper; and if there be no excessive irritation, but more discharge than any thing else, turpentine in small quantities has been occasionally used with advantage; and so has uva ursi. You may put an ounce of the latter to a pint and a half of water, and boil it down to a pint. Cubebs, likewise, have been occasionally serviceable. These cases, however, taken altogether, are very bad; and, in a large number of instances, a stone exists in the bladder; or there is a stricture, which gives rise to this irritation; as well as to hypertrophy, or disease of the prostate. If the urine be alkalescent (deficient of acidity), it may be well to give acids and narcotics, in order to lessen the irritation; and, for this purpose, you may give conium, opium, and hyoscyamus. But when the mucous membrane becomes hypertrophied, and there is secretion to such an amount as this, you can do little more than afford temporary relief.

HYPERTROPHY OF THE BLADDER.

So great is the disposition to hypertrophy of the muscles of the bladder, that it is said that no other muscles of the body are so increased by exercise, as the muscular portion of the bladder;—that is to say, if any difficulty exist in the passage of the urine, or there be any irritation about this part, so as to make the bladder contract frequently, no other muscles grow to the same amount. Indeed, in some cases, the inner part of the bladder looks like the inner part of the heart. The muscular fibres and the mucous membrane are so developed, that, at first sight, you would think it was the right ventricle of the heart. The mucous membrane is often softened, both when it is hypertrophied, and when it is not. Sometimes the villi and the follicles are so apparent, that you perceive them instantly; though naturally they are so minute, that you cannot see them. The cellular membrane is frequently hypertrophied, so that the bladder will become hard; and if a sound be passed into it, the hardness is discovered. The mucous membrane is sometimes enlarged;—so that you have the appearance of a polypus. Sometimes fungous excrescences, of a cancerous or encephaloid nature, take place. I formerly mentioned a case of this kind, where encephaloid deposit gave rise to hæmorrhage, which destroyed the patient. Scirrhous tumours are found in the bladder. They are sometimes original; and sometimes connected with disease of other parts;—with a diseased rectum, or a diseased uterus. A cyst has sometimes been found in the organ. It is almost always connected with its internal surface; and, in that case, is most probably a mere sacculus (the dimunitive of "saccus,"—*a bag*). A sacculus, however, may be formed originally; and it may be come so very large, as to be the same size as the bladder itself. The bladder has sometimes been divided into two chambers by adhesions across.

PARALYSIS OF THE BLADDER.

The bladder is frequently the subject of palsy. When a person labours under paraplegia (a loss of power of the lower extremities), he is generally unable to retain his urine. At first he is unable to make water; so that it continually requires to be drawn off. This you see in paraplegia from accident. After a time, however, the detrusor urinæ muscle loses its power, and then the sphincter also loses its power; so that the patient cannot *retain* his urine. These parts are much disposed to become diseased in old men;—just as the uterus and the ovaria are disposed to fall into disease in old women. When the prostate and the parts of generation have done their duty, they fall into a diseased condition;—just as similar parts do in women. The bladder suffers with the rest; so that old men are frequently unable to sit like young ones, and will be obliged from time to time, to go out of the room. Sometimes this will occur from accidental circumstances. I have known paralysis of the bladder occur from an opiate injection. This is worth knowing. From having a suppository, or an injection of opium, the bladder has become paralyzed; so that it has been necessary to draw the water off; and this has occasioned much alarm. On a repetition of the injection, the bladder has become so torpid, that actually retention of urine has occurred. Sometimes it is produced by a torpid state of the system,—where the head is oppressed. It is a thing which frequently occurs in fever; and sometimes, without any obvious reason, the bladder loses its power; just as any other part of the body may do.

If there be no disease of the spine, and no organic disease of the bladder, no inflammation,—nothing more than the simple paralysis, without your being able to trace it to any thing more than torpidity, then cantharides is one of the best remedies. So, perhaps, is electricity; and any thing else that is stimulating.

You are aware, from surgical lectures, that the bladder may be in this state while the urine is dripping away; for when the organ is distended to a certain amount, the urine will pass (*guttatim*) involuntarily. This is called *stillicidium urinæ* ("stillicidium" being derived from "stilla,"—*a drop*; and "cado,"—*to fall*). The patient will tell you that he cannot hold his water; while, in fact, the bladder is full, and can hold no more. It is therefore necessary, in these cases, to ascertain the condition of the bladder. Very frequently it happens that this form of paralysis takes place temporarily. If a person do not make water in proper time, he loses the power of voiding his urine, and distention is no longer felt. The muscles have no longer power to empty the bladder, and it remains greatly distended, although the urine is constantly coming away. When you are told, therefore, that a person cannot hold his water, you have to ascertain whether he is not holding too much, and cannot hold any more.

DISEASE OF THE PROSTATE.

With regard to disease of the prostate itself, you will continually be consulted upon it; as it occurs so frequently in old men. From the pressure, there is frequently a great difficulty in making water; and sometimes it acquires so very large a size, that there is difficulty even in going to stool. There is pain there; and the abdomen, at last, falls into a state of disease; and death is frequently the consequence. After death, you will find the prostate full of large cells. It is very much hardened; and perhaps it has acquired an immense size. This may be ascertained during life, by the introduction of the finger into the rectum. Calculi frequently come from the prostate; and they are sometimes found, in very large quantity, in the cells of that gland. Occasionally they will grate against a sound, when it is passed on towards the bladder. They are generally small,—sometimes exceedingly so; and are always, I believe, found to consist of phosphate of lime.

With regard to the *treatment* of disease of the prostate, you have chiefly to resort to surgery;—drawing the water off regularly. On account of the great pain, however, it is sometimes necessary to employ narcotics; and I think it would be worth while, in such cases, to give iodine a fair trial;—to rub in iodine and hydriodate of potassa externally, and to give it internally. I have not had many opportunities of treating such cases, because they generally fall to the surgeon; but I have treated them occasionally; and temporary benefit has ensued. I have had two or three patients, in whom there appeared to be a temporary alleviation of the complaint; and if any thing would afford temporary relief, it would be iodine. I do not know whether it would *cure* a case of this description; but I should expect to do more good by it than by any other remedy.

GOUT.

I have now finished the consideration of diseases of the urinary organs;—so far as it is incumbent on me to treat of them. I will now speak of an affection, which is very much connected with disease of the urine; although it is another complaint. I refer to *gout*. When persons have the gout, I am never surprised if they have stone;—gout and stone so frequently go together; though gout is a disease which, in the first instance, affects the joints. It is called the "gout" from the Latin word "*gutta*," or the French word "*goutte*,"—which, in its turn, comes from the Latin word "*gutta*,"—*a drop*. It is so called because it was supposed to arise from a deposition of *drops* from some morbid fluid in the joints. In Latin it is now generally called *arthritis*,—"inflammation of the joints," (from αρθρον, *a joint*; and "itis," *inflammation*). In the classics, it is spoken of under the head of *podagra*, when it affects the feet (from πους, *the foot*; and αγρα, *a seizure*); *chiragra* when it affects the hands; (from χειρ, *the hand*; and αγρα, *a seizure*); and *gonagra*, when it affects the knees (from γονυ, *the knee*; and αγρα, *a seizure*); but all

these "*agra*" are comprehended in the term *arthritis*. Although this term means "inflammation of a joint" from *any* cause, yet it is now appropriated solely to *gout*.

When this affection makes its first attack, it generally begins at two or three o'clock in the morning;—just at the time that a fit of asthma commences; as, indeed, do some other diseases. Usually it first attacks the ball of the great toe. The patient wakes in the most excruciating pain. He then becomes feverish; and continues in this state till the next midnight; when the pain remits. The following morning, he finds his toe swollen and reddish; and he has exacerbations of the pain for several days and nights. The disease then frequently declines; the patient perspires freely; and the part itself loses its cuticle. The cuticle desquamates; there is violent itching for some days; and then there is an end of the business.

After a time, sooner or later, the same thing occurs again. Perhaps the disease attacks the balls of *both* great toes; perhaps it flies from one to the other; and affects the hands, the knees, or the wrists. So also it will shift its place, during the same attack;—running from one knee to the other, from one wrist to the other, from one ankle to the other, from the hand to the feet, and *vice versâ*. The more frequently it comes, the less probability is there of its being confined to the fingers or toes; and the more likely is it to spread to the ankle, to the wrist, or even to the elbow and other joints; perhaps the shoulder becomes affected. But it begins at first in the smaller joints, and affects them to the last;—going to the others only occasionally. Generally the intervals between the attacks grow shorter;—the patient has fits more and more frequently; and they often last longer. The joints, at last, may become stiff; and deposits will take place under the skin; so that the joints of the fingers and toes become enlarged, swollen, and harder than is natural. Occasionally a solid deposition of a white substance takes place, and sometimes it is fluid;—so that if you prick the part which is soft with a needle, you squeeze out a quantity of matter, like soft mortar. Not unfrequently there is a nephritic attack,—an attack of inflammation of the kidneys; with a deposition of lithic acid, or some compound of it. Occasionally these things take place with the gout; occasionally they take place only during the intervals; but a deposition in the urine, and a fit of the gout,—where there is a deposition in the joints,—are frequently very closely connected.

After the attack, people are generally better than they were before. They find it does them good; and therefore they are not at all sorry that they have had the disease. Many persons long for a fit of the gout, when they have not had it before. They say that gout is in the family; and that if they had an attack, they should do well. These who *have* had it, if any thing be the matter with them, are satisfied that they should be a great deal better, if they had another attack; and many people try to bring it on. Before the attack, there is frequently indisposition of some sort;—the symptoms that I mentioned under the head of "disorder of the digestive organs."

There may be langour, or lowness of spirits, or pain of the head, or wandering pains (*gouty* pains) coming and going in the larger or smaller joints. Sometimes there are palpitation and giddiness;—functional diseases, in short, in almost every part of the body.

If these symptoms exist for some time,—so that the patient really feels himself diseased, the disease is called "*atonic* gout,"—gout without strength (from *a privative*; and τονος, *strength*),—gout where there is not sufficient strength to bring it out. A gouty disposition exists; but there is not activity enough in the system to bring it forward. Sometimes, when the gout has come on in a very satisfactory manner, it will suddenly cease. It will not retire to another joint, but will suddenly cease altogether; and the patient will have some internal affection;—perhaps apoplexy, perhaps violent vomiting, perhaps gastrodynia, or perhaps violent colic. It will be some severe internal disorder; and it is then called "*retrocedent* gout (from "retrocedo,"—*to go back*). Sometimes the affection within is of an inflamatory nature; and then it is called "*misplaced* gout;" but it is no matter whether we call it "retrocedent" or "misplaced;" for inflammation is very often ascribed, by old authors, to some nervous affection, or to something else. You have only to consider that, if the gout does not come out satisfactorily, it is "*atonic* gout;" whereas, if it suddenly cease, an internal part is affected in a violent degree, it is "*retrocedent* gout" or "*misplaced* gout," according to the affection that is going on.

Some persons have had very extraordinary symptoms relieved by gout. I knew a gentleman who had had pain of the stomach (gastrodynia) for many years. I know not *how* many years it was; for he did not attend to it much; but at last a fit of the gout came on; and he has never experienced the pain since. Palpitation, which has existed for a long time, has frequently ceased upon the occurrence of a fit of the gout. Strangury, cystorrhœa, piles, and almost every disease you can mention, has ceased on the appearance of gout. Sometimes they alternate with gout; and if such affections be very violent indeed, then they may be called "misplaced gout;" for they have come on when gout should have appeared.

The disease, at first, most frequently commences about the end of January, or the beginning of February. There is no universal rule; but it occurs more frequently then, than at any other time. It occurs in males, much more frequently than in females;—just as is the case with regard to "stone." It is also said to occur in *robust* males, far more frequently than in *weak* ones. It never has been known in eunuchs;—at least, so it is said. If such be the case, gouty old gentlemen have an easy remedy. It is also a disease that is very hereditary. This is one of the great hereditary affections. If it occur in females, it is generally in *masculine* females;—those who have a little touch of the male in them;—robust, hearty-looking women. I do not say this is the case *universally*; because I have seen the reverse myself. It occurs particularly in men who have circular chests, short necks, and broad heads;—such as are called

thick heads;—not in those who have large foreheads; but in those who have bulky heads altogether, and who are of full habit. It occurs chiefly in those who eat a great quantity of flesh-meat, and drink a good quantity of wine. Among those who are predisposed to it, it seldom occurs till after thirty-five years of age. I have seen it in persons below puberty; and it is said to have occurred in infants; but, more frequently than not, it takes place in those who are above thirty-five; who indulge at the table; and who are of a plethoric habit. Such are the predisposing causes.

The pain, in gout, is not only very severe, but is also of a very peculiar kind. Sydenham, in writing of his own sufferings, compares them to the gnawing of a dog; and patients who have suffered from it extremely, say they can distinguish between the pain of gout, and that of rheumatism.

In speaking of the predisposing causes of the disease, I mentioned that, for the most part, males suffer from it more than females; and that where it does occur in the latter, they are very robust. The males who experience it are chiefly those who are thick, stout, and of a sanguineous temperament; but occasionally you will see it in persons who are extremely thin, spare, and emaciated. Although the disease, in a great number of cases, is connected with a certain development or form of body, yet, in many instances, it certainly does arise independently of any external appearances whatever. Sometimes very delicate women are subject to it;—persons whom you would imagine the least likely to suffer from it. In those cases in which the external appearances are not such as would lead you to suppose that the patient would have it, there is usually a strong hereditary predisposition; and where this predisposition exists, you will have the disease,—whether it is hereditary or not. You not only will meet with cases where the external appearances are such as would lead you to suppose that the person would suffer from the disease; but it will occur in the most temperate individuals;—in persons whose habits are such, and *have been* such, as to make it very unlikely that they should have an attack of gout. The disposition to the disease may be exceedingly strong; and persons may become the victims of it, independently of the external appearance of the body, and independently of any of those excesses which so frequently produce it.

I stated, with regard to the progress of the disease, that it generally begins in one great toe; that, on the second attack, it perhaps occurs in both; and that so it spreads to the other joints; till, at last, after several paroxysms, many joints will be affected. And not only does the disease become more extensive, but it also becomes more frequent; so that persons at first, perhaps, have a paroxysm every year or two; and then every year; then two or three paroxysms in a year; and at last they are scarcely ever without it;—they have it on the least exciting cause. I should have mentioned also, that some persons never have above two or three fits in the course of their life. I know an instance of an individual who, when

about thirty-five years of age, had an attack of regular gout; and, although he is now upwards of seventy, he has never had an attack since; though he has taken no particular care to avoid it. These are exceptions to general rules.

I mentioned that many symptoms will cease, when an attack of gout appears;—so that it is a very common thing for persons who have suffered in various ways, to suffer no longer after they have had a fit of the gout. This fact made so great an impression on the public, at one time, that gout was longed after as a great blessing; and people, with all sorts of complaints, would eat and drink, take a large quantity of wine, and do all they could to have a fit of the gout. As it is a disease which attacks the rich more than the poor, it was altogether a fashionable complaint. It was thought a creditable disease; and, at one time, every body longed for it, or declared that they had had it. You will find this whim strongly argued against in Dr. Heberden's "Commentaries;" which it will be worth your while to read;—not only on account of the elegant Latin, but for the excellent description which he gives of the disease; although, for the most part, he adopted poor and inert treatment.

The disease is particularly favoured by indulgence in wine. All fermented liquors do not appear to give the same tendency to it; and as to spirits, I am inclined to believe that, so far from disposing persons to the disease, they have a tendency to prevent it. At least, I hardly know an instance in which a person who has committed a great excess in spirits, labours under the disease; although wine-drinkers have it every day. It is a very rare complaint among the poor. Now and then, you will see it among them, because there is a peculiar predisposition to it in some persons; and sometimes it is hereditary, and will occur in spite of the absence of all the ordinary causes; but, for the most part, you will not meet with it in the lower walks of life. I have seen persons who, from their make of body, and from the occurrence of the disease in their progenitors,—many members of the family having had it,—were the most likely persons in the world to experience it; but who, from indulging in spirits to a disgraceful excess (and excess of that kind is *always* disgraceful) have not suffered from gout; although, beforehand, one would have said that they were most likely to have it by the time they were forty or fifty.

When a person is liable to gout, a paroxysm may be induced by the very slightest cause. If he indulge in eating and drinking too much, on any particular occasion, a fit of the gout is very likely to be the consequence. It will occasionally ensue from mental anxiety. Exposure to cold,—which, in another individual, would induce an inflammatory complaint—will, in those predisposed to gout, produce a paroxysm. Even accidents,—such as a sprain of a joint,—will become local causes; and the patient will have an attack of gout, in that particular part. When persons have the disease for a length of time, it is very common for internal organs to become seriously diseased. It is very usual to see persons who have been the victims

of gout become asthmatic, or have disease of the kidneys, or have organic diseases of the stomach and intestines, or have chronic bronchitis. Very frequently, disease of the heart supervenes, and disease of the head occurs;—so that they die apoplectic. The gout, at last, is not confined to the extremities; nor are the internal symptoms merely functional; but the organs in the three great cavities of the body become diseased.

As to the *prognosis*, that must depend on the degree of the original disposition, on the part of the patient, to the disease; and also, in a great measure, upon the resolution which he has to follow up our advice. A great number of persons who have the gout, are very disobedient in this particular.

With respect to the *cure* of the gout, in general it is necessary that the patient should be very abstemious;—that he should live as low as he can to be in good health; and take as much exercise as he can bear;—only taking care that his health is not impaired by its violence. It is impossible to lay down any specific rule; and to say that a man, disposed to gout, should not drink wine,—should not drink beer,—should not eat meat, would be wrong. There are some gouty patients who would be better, if they left off fermented liquors; others would be better if they went farther, and ate no meat, but confined themselves to vegetable diet and milk. There are other cases, again, where this would be absurd;—the patient could not live without meat; and there are other cases where it is necessary to allow a certain quantity of wine. The rule should be, to let patients live as low as they can to be in good health; and that point must vary in different individuals. The stomach of many persons labouring under gout is so weak, that they cannot digest their food without a certain allowance of wine; but, generally speaking, the diet I have recommended, and as much pleasant exercise as possible without weakening the patient, is advisable. No doubt, however, there should be extreme temperance. The patient should not take more wine, or eat more meat, than is necessary. No doubt many persons will thus get rid of the gout altogether, with the most perfect ease; and no doubt others, who will not get rid of it,—(and these may be by far the larger number),—will have it very much mitigated. It is necessary that they should be particular in their food;—that if they eat any food, they should take that which is the most digestible; such as fresh mutton, or fresh beef; without any sauce, or elaborate preparation on the part of the cook. They should take simple Sherry or Madeira, and not mixed wines. Above all, they should not take acescent wines, such as Champagne; and perhaps they had better take brandy-and-water. Many persons, from taking Rhenish wines, or Claret, or Champagne, have a fit of the gout directly. In general, Sherry agrees best; and therefore you should recommend it;—unless the person knows, from his own experience, that some other wine, or a small quantity of brandy mixed with water, is better for his constitution. I am supposing that the stomach of the patient requires such a plan to be adopted.

Friction is exceedingly useful, where exercise cannot be adopted. It would be well for many persons who are lame in the feet, to be rubbed down, once or twice a day, like a horse. It would be very beneficial, in a great number of cases; and they would find it to be a very great luxury.

In a regular fit of the gout, the best medicine that can be given, is colchicum. You should exhibit the wine, in half-drachm doses, every six hours; and it should be mixed with some other purgative; because you want its action to be speedy. The sulphate of magnesia makes a good combination with it. You may produce purging in twenty-four hours, or sooner; and when that takes place, the patient is generally relieved at once. Any good, active purgative will have a beneficial effect; but colchicum appears to be more efficacious than any other. Unless it purges, however, it will seldom have any influence. Now and then, the symptoms will all cease after two or three doses; but, in the greater number of instances, so desirable a result does not occur till purging takes place. It is better to quicken the purgative effect, in order to prevent it from griping; and the sulphate of magnesia will excite its action so much the sooner. Venesection may be advisable in young persons; but, in general, it is out of the question. Leaches applied to the part, are frequently productive of very great alleviation; and it is a great comfort, in general, to apply an evaporating lotion;—not cold, but tepid. A spirituous lotion applied tepid, so as not to produce a chilly effect, is generally serviceable. There can be no doubt, frequently, of the great use of colchicum, and of evaporating lotions: and when they are being employed, the diet should be scanty.

When the paroxyism is over, (and it need never last long if you treat it in this way), friction of the parts is always found useful;—rubbing them with a flesh-brush, or the hand, and some salt-and-water, or similar stimulants. Sometimes it is necessary to give wine, or mild tonics, to relieve the langour that is left; but it is by no means *always* necessary. Occasionally, from the great severity of the pain, opiates may be required; but it is necessary to use the antiphlogistic measures that I mentioned. If all this be done, and the patient's life is continued, the disease becomes comparatively trifling. I say "comparatively"; because it is always painful; and therefore there is more or less suffering. But it is not nearly so painful as it would be, if patients wrapped up their limbs in flannel; took no colchicum; and, in the intervals of the disease, indulged in every absurd way they could. It is dangerous to apply cold to the parts during an attack of gout. Some have done it; and Harvey, who discovered the circulation of the blood, was accustomed (when an attack came on) to plunge his feet in a pail of cold water. I know persons that do this; but no medical man is justified in recommending it; for it has frequently happened that some disease has suddenly begun within. There has been apoplexy induced; or violent gastrodynia; or an affection of the heart; and the patient has died very shortly. If the patient chooses to do it on his own

risk, he may; but he ought to be warned of the consequences by his medical friend.

Gout is a disease which it is not easy to eradicate; but, by the employment of colchicum, the disease is rendered much less violent than it was a few years ago. Formerly colchicum was employed with great success; and then it was forgotten entirely, till within a very few years ago. When I was a student, no one thought of exhibiting colchicum, in any form. It was only spoken of as a thing once used;—as an uncertain diuretic, and a violent purgative; and it was thought that it would be better, if it were expunged from the Materia Medica. I spoke of the *wine* of colchicum; but the powder and other preparations are very good. I have been in the habit of using the wine; and it has answered very well. Some give the powder, in doses of five grains, every four or six hours; and some give the Acetum Colchici. In general, it certainly does no good till it purges; though sometimes the opposite is the case.

RHEUMATISM.

The next disease of which I will speak, is nearly allied, in many particulars, to gout; and is called *rheumatism.* As "gout" is named from the idea of the dropping of morbid fluid, so "rheumatism" is named from a similar idea;—the term being derived from the Greek word ρευματιζω (from ρεω, *to flow*). It is said that gout and rheumatism were not accurately distinguished from each other, till the year 1642;—both of them passing under the name of *arthritis.* Bellonius, who was a physician that suffered much from rheumatism, is said to have been the first that made an accurate distinction.

Rheumatism may occur in an *active*, or in a dull *passive* form; and the two varieties require very opposite treatment. In the *active* form of rheumatism,—that which is commonly called "*acute* rheumatism,"—there is heat, pain, and (in most instances) a swelling of the joints. These are not the *smaller* joints, as is the case in gout; but the *large* ones; in general the wrists, the ankles, the elbows, the knees, the shoulders, and the hips. When these parts are affected with it, there is pain; but nothing of that violent kind which occurs in gout;—as if a dog were gnawing the joint. It is as violent as a patient could wish it to be; but by no means so horrid as gout. The parts are generally hot and red; and frequently, from the pain being situated in the theca of the tendons, I have seen red streaks running in the situation of the tendons. There is generally swelling and puffiness in some part. Usually, there is feverishness, pyrexia, and a quick pulse. The pulse is not hard; but, in general, full and soft. The tongue is not foul and dry; but, in general, very white; and the urine is high-coloured, and deposits a lateritious sediment.

This disease does not, like gout, begin particularly in the night; but invades at any time; and it does not come on at any particular season of the year. It arises from an evident exciting cause; and therefore it may come on at any time. It does not confine itself to

one joint particularly; but leaves one and goes to another; and it will attack two or three at the same time. There is a shifting about; —it migrates in the most singular manner. Not only is there heat and an increased temperature, but heat generally makes the patient worse. Usually, too, there is profuse sweating: and the perspired fluid is often exceedingly sour to the smell. When the disease goes off, the parts do not desquamate and itch,—as they do after gout; but they merely cease to be hot, cease to swell, and cease to be inflamed. This is the usual state of things when the disease begins suddenly as an *acute* disease; but you will find a similar state of things in the *chronic* form. When the disease has lasted a twelvemonth, you will find the parts still hot, still swollen, and still painful; and the pain is increased if heat be applied. You will find the same symptoms as in the acute affection; only they are less violent. In general, however, the sweating does not continue; for after the disease has lasted a few weeks, this symptom ceases; and the patient, perhaps, forgets it. It is sometimes a little difficult to make an accurate diagnosis;—at least it requires a little trouble; and it is well to ask about the sweating. If the disease have been acute rheumatism at first, you will find there has been sweating; at least, it is unusual for a person not to sweat at the beginning of the disease.

Although the joints are the parts particularly affected, yet persons frequently have the disease in the back; and then it is called *lumbago*, (from "lumbus," *the loin*). Frequently it occurs in the back of the neck; and then the patient is said to have "a crick in the neck." It may affect the face; and, indeed, it may affect almost any part of the body, where there are fibrous membranes, aponeuroses, ligaments, tendons, or (perhaps) muscles. There is no danger whatever from this disease, except from one circumstance;—which is, that the membranes within the chest (the pericardium and the pleura), are liable to be affected. They are sometimes attacked during the disease; but when the disease has suddenly ceased, or has gone off gradually, inflammation within sometimes takes place. This internal inflammation will occur at all periods, and in all possible circumstances; but it most frequently takes place about the time of puberty, and in young adults; so that, in acute rheumatism, you should never omit observing the state of the chest;—just as, in the case of an obstruction of the bowels, it is right to ascertain whether there is a hernia or not. Now and then, inflammation occurs within the head, and phrenitis is set up; but that is rare; whereas inflammation of the pleura and pericardium, particularly the latter, are very common.

The *active* form of the disease, I mentioned, may be either acute or chronic. The chronic form *may* have active symptoms; but very frequently it has not;—the parts are not hotter than they ought to be; but, on the contrary, are relieved by heat. This is sometimes the case in the *acute* form of the disease;—that is to say, it occasionally happens that persons, when they are first attacked with

rheumatism, have no heat;—the pain is not aggravated by heat; but the parts are cold, and are the better for the application of heat. It is generally, however, in the *chronic* form of the disease, that the parts fall into this state of atony. The disease sometimes appears to consist of little more than violent pain. You will sometimes hear people complain of pain apparently in the muscles; but it may be situated in the aponeuroses over the muscles. There is simply pain on motion; a pain not at all increased on pressure; and there is no swelling. This form of the disease has been called *rheumatalgia.* I do not know the necessity for giving it this name. Although rheumatism generally affects the fibrous membranes, yet sometimes it apparently affects the muscular fibres; and sometimes it appears to affect the nerves, or their covering; so that it will distinctly run down the sciatic nerve; though it is most frequently seen in the nerves of the face. I mentioned, when speaking of "tic douleureux," that sometimes, besides the genuine form of that disease, you have another affection, called *neuralgia* (from *νευρον, a nerve;* and *αλγος, pain*), which is easily cured. When rheumatism affects the nerves, it clearly exists in their course, and then it frequently assumes an intermittent form. This is particularly the case in the head.

Rheumatism is sometimes intermittent, when it does not affect the nerves particularly; but when it affects aponeuroses; and this form of the disease most frequently attacks the head. In this case, it usually affects one half of the organ; and the pain generally comes on in the evening, about six o'clock; and continues, very violently, for a few hours. Occasionally, when it is intermittent in this way, the parts are hot, swollen, and throb; and the eyes water. But, in other cases, this is not felt; and the patient is all the better for wrapping up his head in his wife's flannel petticoat; or, if the patient be a female, she wraps it up in her own. This is done among the lower orders; and with very good effect.

Occasionally the parts, when long affected with the disease, become thickened. You will have considerable thickening of the joints. The small joints of the fingers will throb, from time to time; and the patient will become a cripple, in consequence of the joints being inflexible;—just as in the case of gout. When rheumatism affects the smaller joints, in the same way as gout, it is called by the common people *rheumatic gout.* Not that it is a combination of the two; though it sometimes may be. But as *gout* affects the *small,* and *rheumatism* the *large* joints, if rheumatism should affect the *small* joints, then it is usually termed "rheumatic gout." You may have the same appearances both from gout and from rheumatism.

There is, I believe, but one exciting cause of the disease; and that is the application of cold, or cold and wet; more especially if the patient be fatigued. I do not know that I ever saw a case, in the whole course of my life, that arose from any other circumstance. I mentioned before,—when speaking of inflammation generally,—that rheumatism does not terminate in suppuration. If suppuration occur, it must arise from another inflammation being accidently present, or being

excited by it. Neither does it terminate in mortification. There is sometimes effusion into the joints;—a considerable secretion of synovia or of fluid in the bursæ; and sometimes in the tendons. The parts may become rigid; and then, sometimes, mortification has been the consequence.

Rheumatism will occur in infants, as well as in old people; and this is worth knowing. I have seen many cases of the disease in very young children;—a circumstance very likely to be passed over; and I have also seen disease of the heart in very young children; as a consequence of pericarditis excited by this disease.

As to the *treatment* of the affection, whether it is acute or chronic, it should be exactly the same. You have only to make two distinctions;—to ascertain whether it is the inflammatory form of the disease;—whether the parts are hotter than they should be, and heat does *harm*; or whether the parts are *cooler* than they should be, and heat does *good*. In the one case, antiphlogistic measures will be required; and in the other stimulants. Sometimes, where the patient is plethoric, it is advisable to take away blood from the arm; and you will find it buffed and cupped, but there is no danger whatever from that circumstance; for if you go on bleeding, you may find the blood buffed and cupped, till you have got nearly all the blood out of the body. But venesection is not always required. Free *local* bleeding generally answers better; but there is no objection to *general* bleeding, if the strength will allow it; and if several large joints be affected, it will then be *better* than local bleeding. With respect to the parts themselves, whether you apply leeches, or cupping, or not,—you will find it of great use to apply cold water or cold lotions, as long as the temperature is higher than it ought to be, and they feel comfortable to the patient. There is no danger in applying cold, with these limitations. If the patient should be timid, and yet long for cold evaporating lotions, they may be applied tepid, as in the case of gout; but I never saw injury arise from applying cold in rheumatism, where the parts were hotter than they should be, and the patient felt hot.

The two best internal medicines are, without doubt, colchicum and mercury. Colchicum here, as in the case of gout, generally does no good till it purges; and when once it purges the patient thoroughly, the disease usually gives way. It should be given in the same way as in gout;—that is to say, with magnesia; that it may produce its effect as speedily as possible. As soon as it purges, it is right to desist; and also as soon as its effect ceases. If you give a dose of hydrocyanic acid with the colchicum, it sits better on the stomach. You may exhibit one, two, or three minims of the acid. But, every now and then you will find obstinate cases; which will not easily give way; although the greater part of them do; and then it is a pity to go on with the colchicum. You had better exhibit mercury, and get the mouth tender. If you do this, in the first instance, instead of giving colchicum, the success is about the same. Colchicum may gripe, and mercury may make the mouth sore;—so that

you may not be able to continue them. You may then leave off the one (whichever it may be) and exhibit the other; or if you begin with one of them first, and find it does no good, then you may exhibit the other.

As soon as the inflammatory symptoms have gone down, and the patient has been properly evacuated, many give bark and quinine. It has been said that bark is a safe and good remedy even in active inflammatory rheumatism; but you will not find, in Haygarth's work, any authority for such practice. You will find, in his book, accounts of the successful treatment of rheumatism by bark; but then it was not till he had evacuated the patient upwards and downwards, and employed the antiphlogistic plan. After that, it is said that bark prevented the disease from recurring. I have not had occasion to use that medicine; for I have found the disease give way under the treatment I have mentioned. It may be right to give narcotics, in order to produce ease; and a full dose of opium may be proper at night. There is no harm in it, provided you adopt antiphlogistic measures;—provided you bleed as far as bleeding is indicated, purge the patient well and apply cold.

Exactly the same treatment is proper in the *chronic* form of the disease, if there are inflammatory symptoms; but whether the disease be recent or chronic, if the parts are not in this condition, an opposite plan should be adopted; and it is right to stimulate the parts. In this case, you will find friction an excellent remedy; and you will find the hot bath (particularly the vapour bath) very useful. If the patient find alleviation from warmth and stimulants of all kinds, or the parts are colder than they should be, then this plan should be put in practice. The hot bath should be employed, not every other day, but every day; and sometimes it should be used, in cases of extreme coldness and extreme pain, twice a day. It is here that electricity is of use; as well as friction; together with stimulating washes, stimulating liniments, and croton oil;—which is a good stimulant when applied externally, and does not purge when it is so employed. Tartar emetic and sometimes moxa have been employed; but only, of course, in very severe cases.

It is in this description of the complaint, that you find acupuncture of great use.* It is only in the fleshy parts that you can intro-

* Much information on this subject will be learned from Dr. Elliotson's paper on Acupuncture; in the "Cyclopædia of Practical Medicine." We subjoin his observations on the term itself. "The passing of a needle into the body, is termed *acupuncture* (from '*acus*,'—*a needle*; and '*pungo*,'—*to prick*). From forgetting that the word '*puncture*' has two significations,—that it is used to express both the wound and the act of making it,—some have termed the operation '*acupuncturation*.' But to subjoin the syllables '*ation*' to the word '*puncture*' or '*acupuncture*,' is as improper as to subjoin them to the words '*preparation*' and '*fabrication*;' each of which already ends in '*ation*,' and has a similar two-fold meaning. An exactly parallel error would be to say '*manufacturation*.'" Dr. Elliotson gave the plan an extensive trial in St. Thomas's Hospital; and has published the result of that trial, in the fourteenth volume of the "Medico-Chirurgical Transactions." Out of forty-two cases, thirty were cured.

duce the needle.* I should never advise it to be put into tendons and joints; though I have seen such things done. In general, it is only in the fleshy parts,—such as the deltoid, the biceps, the gastrocnemius, the rectus, or the gluteus muscles,—that it is right to put them. The best mode is to roll them by pressing them between your fingers; and they will soon pass to the desired length. You may insert them an inch and a half in depth; and if the bone is in the way, as in the case of the os femoris, there is no harm in the needles coming upon it; though there is no use in it; but they may go as far. The success of the operation does not depend on the number of needles; but on the time they remain in. If it be comfortable to the patient, you may let them remain in a couple of hours; that is, as long as a patient can bear to be kept still. There is no pain worth notice when they are introduced; and when they are in, there is no pain at all. It should be done every day; and occasionally you will find relief as soon as they are taken out the first time; but, in other instances, not till they have been employed two or three times; or perhaps oftener than that. It is only where the parts are not hotter than they should be, that acupuncture is of any use. I never saw it do good when heat increased the pain. Acupuncture is not an absurd remedy. It is a *strong* one; but I am quite satisfied it is a real remedy, if it be properly applied.

In the *chronic* form of rheumatism, you will find mercury of the same use as in an *acute* attack. Whether the parts are hotter than they should be, or not, you will find obstinate cases give way to mercury, when they will not yield to any other medicine. Nothing is more common than for persons who are the victims of chronic rheumatism (whether it be inflammatory or not), but who are suffer-

* M. Brettonneau says, that he has passed needles into the cerebrum, cerebellum, heart, lungs, and stomach, of sucking puppies,—through and through, in all directions,—with no sign of pain, nor with any particular ill effect; unless when too large a needle was thrust into the heart; and, in one instance of this, a little extravasation took place into the pericardium. So far from fearing to acupuncture the heart, Dr. Carraco would have us do so in the worst cases of asphyxia. He declares that, in the presence of several persons, he kept several kittens under cold water, till they were apparently dead,—stiff, motionless, frothing at the mouth, without pulsation of the heart, and regularly sinking to the bottom of the water, every time they were thrown in; that he passed a needle into the heart; that soon the needle began to be gently agitated, then rapidly so; and that one voluntary motion after another gradually took place, till life was fully re-established; and that the animals did as well afterwards, as if nothing had happened. Death, however, by acupuncture of the brain or spinal-marrow,—as a secret mode of infanticide,—is notorious in works on State-Medicine. "Guy Patin," says Foderé, "relates that a midwife was executed at Paris, for having murdered several infants at the moment the head presented at the os uteri, by passing a long and very fine needle into the brain, through the temples or the fontanelles; into the nape of the neck; or into the heart or its large vessels. Alberti and Brendel quote similar examples. In the "Causes Celebres" we read the horrible story of a woman who, towards the middle of the last century, made it her business to murder all the new-born infants that fell into her hands, by acupuncture,—practised at the top of the vertebral column, or in the brain;—with the sole intention, as she told the judges, of peopling heaven more and more."—*Elliotson on Acupuncture, in the Cyclopædia of Practical Medicine; Volume I; Page* 34.

ing great pain,—more especially if the pain be worse at night,—to receive no benefit whatever, till they have undergone a course of mercury; and as soon as the mouth is sore, they will lose all the pain. Mercury appears equally useful in both kinds of rheumatism. You will find that one of the best internal stimulants, in a case of this sort, is the ammoniated tincture of guaiacum. Guaiacum is a stimulating diaphoretic, and is very useful in this form of rheumatism; though it is of no service in the *active* form of the complaint. If you give the tincture made with aromatic spirit of ammonia,* you produce great warmth; and the patient remains warm for a longer or a shorter time. This is a medicine that may be given in various doses. Some persons are made hot with thirty drops; but others will take a drachm; and I have seen some who have taken six drachms, three or four times a day. There is no rule for it; but you shold begin with half a drachm; and, as long as the patient is not warmed by it, and does not find it irritate him, you may increase it. You will sometimes find the warmth last for one, two, or three hours, and from a proper course of it you will find great alleviation. Sometimes it purges; sometimes it irritates the skin, and produces the nettle-rash; but when internal stimulants are necessary in rheumatism, I think this is one of the best. In the chronic form of the complaint, it is often necessary to support the patient well;—to give him wine, and nourish him assiduously.

Arsenic has an excellent effect in this form of the disease, where the joints become cold. It frequently requires to be well persevered in; and (just like colchicum) you will find it borne by the stomach infinitely better, if you give prussic acid a little before it, or at the same time. Arsenic is a medicine which is much disposed to irritate the stomach and bowels, and to produce gastritis; and, short of that, it frequently produces nausea and vomiting; but that may generally be prevented by prussic acid. The moment you find heat in the stomach and bowels, and pain on pressure, it should be omitted. You should ascertain this point every day; and when it occurs, the medicine should not be resumed till these symptoms have gone off. Arsenic also produces soreness of the eyes, and redness of the throat; and when any of these symptoms arise, you must desist from exhibiting the medicine; and not resume it till they are gone off. As to the dose, there is no particular rule for it. It is best to begin with two or three minims; and as long as it is borne without doing the patient any harm, you may increase it. I have known cases where thirteen or fourteen minims were borne; but that is a large dose. In general, seven or eight minims are as much as can be given. I do not know that there is any danger in the œdema induced by the medicine; but it shows that it acts on the body, and therefore it is better to desist. With regard to the gastritic affection, that would be dangerous if the arsenic were continued; but with a careful practitioner, no danger can arise from this remedy. In the chronic form

* The *Tinctura Guiaci Composita.*

of the disease, blisters, setons, and moxæ, may be of use;—just as in any other chronic inflammation.

If the disease assume an intermittent form, you must treat it in some measure as intermittent fever. You must give a large dose of quinine or bark, either just before a paroxysm is expected, or afterwards; and smaller doses in the intervals. Or you may employ arsenic. When rheumatism affects the face, a large dose of a narcotic, given just when the paroxysm is about to begin, often acts like a charm. It is an excellent plan to give a dose of stramonium, at the time the pain is coming on; and to repeat it in two or three hours. A large dose is generally required; and therefore, in the case of an adult, it is better to give a grain. In two or three hours, if there be no alleviation of the pain, and no affection of the head, you may repeat the dose. Sometimes the pain will not cease, till you have exhibited two or three doses; but I do not know more than one or two cases, in which this plan failed. It is certainly one of the best you can adopt. The ill effects of stramonium (as I before mentioned) are dimness of sight, great thirst, and dryness of the throat; but these are not at all dangerous symptoms. The most unpleasant symptom is an affection of the head, drowsiness, giddiness, or delirium. I have frequently seen these induced, and then go away after a few hours; but if there be any hazard, an emetic may be had recourse to. If, however, you increase the dose slowly, this effect need hardly ever occur.

CONCLUSION.

We have now arrived at what I intend to be the conclusion of the course. I have spoken of an immense number of diseases to which flesh is heir; and have endeavoured to tell you all I know about them. Of course I must rejoice (as I am sure you do) that our labours are at an end. That is a natural feeling for both of us. I am sorry to part with you; because I have every reason to be delighted with the attention I have received during the course; yet as we are all anxious for a remission of laborious exertion, I congratulate you that our labours are at a close.

I have endeavoured to speak of all those diseases, which usually come under the care of the medical practitioner. I have not digressed in order to speak of other diseases, and to mention a number of other subjects; because I knew that I had so much on hand, that the time would scarcely be sufficient to do justice to those diseases, which came particularly within my own province. It may be that there are some other diseases which I ought to have spoken of; but I do not think I have omitted any, that are not fully treated of in other courses. I allude to surgical diseases, and to diseases of the female organs of generation; which, although a few of them may come under the treatment of the physician, must be particularly spoken of by the professors of Surgery and Midwifery. I have taken advantage of that circumstance to pass over some affections, which I am in the habit of treating, in private practice, daily. I

hope I have not wasted any time, in displaying my knowledge on topics foreign to this course of lectures; because I had too many topics of my own, to be desirous of saying any thing more than was strictly necessary to my particular department. I have advanced nothing marvellous in order to produce an effect; but I have been anxious simply to inculcate real truth, so far as I myself am aware that it is truth.

You are aware that all the instructions given can be no avail, unless you see the facts, which are stated, verified. Unfortunately, in this institution, we have not the means of giving that instruction which is necessary;* but I believe I may assure you, that before this time twelvemonth, the most active means will he taken for affording clinical, medical, surgical, and obstetric instruction.

I do not know whether it is usual now; but it was the custom, when I was a student, to give advice to the pupils, at the end of a course, as to their future conduct. I am not one of those who are disposed to give much advice; because I suppose every gentleman here knows what is right, and what is wrong. I am sure the attempt to quote Scripture, or preach a sermon to you, would be quite out of place. But there are two things which I am particularly anxious to impress upon you; the first is that, in your profession, you should never lose sight of its really delightful nature. I hope you will never become *mere* practitioners;—going about to see your patients and ordering medicines, just as a baker goes distributing loaves round a parish; but that you will consider it a source of true intellectual delight. There is hardly a case that occurs, that may not afford you an intellectual exercise; and enable you to advance your own knowledge a little. Very few practitioners, I am sure, pass six months in the year, without having an opportunity, not only of advancing their own knowledge, but also of adding to the general stock. If you become mere, dull, routine practitioners, I shall indeed be extremely sorry. I trust you will always consider, that although you enter the profession for the purpose of gaining a livelihood, yet happily, in our pursuits, there is an infinitely greater delight than this;—that we have the means of leading the lives of philosophers;—of using our intellect and improving science; which cannot be said of a large number of occupations, to which men are unfortunately destined.

The other point to which I wish to direct your attention is, to avoid every thing that can bring the profession into disgrace. We all witness medical squabbles; and I think nothing can be more contemptible than personal jealousies, carried on so unfortunately as we often see them. When you are in practice, never give an opinion upon any case, unless it is in your own hands. When a case is under the care of another individual, never should an opinion be given upon it; unless it be to corroborate what he has said, and establish him in the estimation of the patient. If you see a man

* These means have since been supplied, by the erection of the University-College-Hospital.

treating a patient in a disgraceful manner, that is another case; but even then it is much better to see the individual himself, than to make any disturbance about it. When you are attending with another practitioner, nothing should be done to lower him in the opinion of the patient. It is right, if you can, always to express your coincidence of sentiment with a brother-practitioner; and if you differ from him, you should not let the patient know it; but argue the point in private. Never say any thing to make a patient think you would have treated him better than your predecessor. If it so happen that a medical man should ill-treat you, (and we must all expect to meet with that), it is best to keep the matter quiet; for if you complain of being wronged, the world will only shake their heads, and say, significantly, " Two of a trade !—Two of a trade !" —and you will gain nothing by it. When your conscience satisfies you that you are the injured person, it is best to learn to pass things over; and to avoid, as much as possible, any appearance of a medical squabble.

I will not pretend to lamentation and grief at parting with you; because I shall have to part with some every year; and I must reserve my tears and lamentations for more serious occasions. I feel the greatest obligation to you, for the kindness with which you have listened to me; and I owe you an apology, for having frequently been late; but I assure you it was unavoidable. In fine, I can only say, that should any occasion occur of being useful to you, it will afford me the greatest pleasure.

APPENDIX.

No. I.

SYNOPSIS OF CULLEN'S NOSOLOGY.

CLASS I.

PYREXIÆ (FEBRILE DISEASES).

ORDER I.—Febres (Fevers).

Section 1. Intermittentes (Intermittent Fevers).

GENUS 1. Tertiana (Tertian Ague).
Species 1. With Apyrexia interposed.
Variety 1. In the Duration of the Paroxysm.
2. In the Recurrence of the Paroxysm.
3. In the Symptoms.
4. In its Complication with other Diseases.
5. In its Commencement.
Species 2. With a Remission interposed.

GENUS 2. Quartana (Quartan Ague).
Species 1. With Apyrexia interposed.
Variety 1. In its Type.
2. In its Symptoms.
3. In its Complication with other Diseases.
Species 2. With a Remission interposed.

GENUS 3. Quotidiana (Quotidian Ague).
Species 1. With Apyrexia interposed.
Variety 1. Solitary.
2. Combined.
Species 2. With a Remission interposed.

Section 2. Continuæ (Continued Fevers).

GENUS 4. Synocha (Ardent Fever).
5. Typhus (Low Fever).
Species 1. Petechialis (accompanied by Petechiæ).
Variety 1. Mitior.
2. Gravior.
Species 2. Icterodes (Yellow Fever).

GENUS 6. Synochus (Mixed Fever).

Section 3. Hectica (Hectic Fever).

ORDER II.—Phlegmasiæ (Inflammations).

GENUS 7. Phlogosis (Inflammation).

Species 1. Phelgmone (Suppurative Inflammation).
Variety 1. In its Form.
2. In its Seat.
Species 2. Erythema (Superficial Inflammation).
Variety 1. In its Violence.
2. In its Remote Cause.
3. In being Complicated.
Sequela 1. Apostema (an Abscess).
2. Gangræna (Gangrene).
3. Sphacelus (Mortification).

Genus 8. Ophthalmia (Inflammation of the Eye).
Species 1. Idiopathica (Idiopathic).
Variety 1. Membranorum (affecting the Globe).
2. Tarsi (affecting the Lids).
Species 2. Symptomatica (Symptomatic).
Variety 1. From Disease of the Eye itself.
2. From Disease of Other Parts.

Genus 9. Phrenitis (Inflammation of the Brain).
10. Cynanche (Sore-Throat).
Species 1. Tonsillaris (Inflammation of the Tonsils).
2. Maligna (Malignant Sore-Throat).
3. Trachealis (Croup).
4. Pharyngea (Inflammation of the Pharynx).
5. Parotidea (Mumps).

Genus 11. Pneumonia (Inflammation of the Lungs).
Species 1. Peripneumonia (affecting the Substance).
Variety 1. Simple.
2. Complicated.
Species 2. Pleuritis (affecting the Surface).
Variety 1. Simplex (Simple).
2. Complicata (Complicated).
3. Symptomatica (Symptomatic).
4. Falsa (False).
Sequela 1. Vomica (Pulmonary Abscess).
2. Empyema (Pleuritic Effusion).

Genus 12. Carditis (Inflammation of the Heart).
Species 1. Idiopathica (Idiopathic).
2. Symptomatica (Symptomatic).

Genus 13. Peritonitis (Inflammation of the Peritoneum).
Species 1. Propria (confined to the Peritoneum).
2. Omentalis (extending to the Omentum).
3. Mesenterica (extending to the Mesentery).

Genus 14. Gastritis (Inflammation of the Stomach).
Species 1. Idiopathica (Idiopathic).
Variety 1. From Internal Causes.
2. From External Causes.
Species 2. Symptomatica (Symptomatic).

Genus 15. Enteritis (Inflammation of the Intestines).
Species 1. Idiopathica (Idiopathic).
Variety 1. Phlegmonodea (Phlegmonous).
2. Erythematica (Erythematic).
Species 2. Symptomatica (Symptomatic).

Genus 16. Hepatitis (Inflammation of the Liver).
Species 1. Acuta (Acute).
2. Chronica (Chronic).

Genus 17. Splenitis (Inflammation of the Spleen).
18. Nephritis (Inflammation of the Kidney).

Species 1. Idiopathica (Idiopathic).
2. Symptomatica (Symptomatic).

Genus 19. Cystitis (Inflammation of the Bladder).
Species 1. From Internal Causes.
2. From External Causes.

Genus 20. Hysteritis (Inflammation of the Womb).
21. Rheumatismus (Rheumatism).
Species 1. Lumbago (in the Loins).
2. Ischiatica (in the Hip).
3. Pleurodynia (in the Chest).
Sequela. Arthrodynia (Pain in the Joints).

Genus 22. Odontalgia (Tooth-Ache).
23. Podagra (Gout).
Variety 1. Regularis (Regular).
2. Atonica (Atonic).
3. Retrogada (Retrocedent).
4. Aberrans (Wandering).
Genus 24. Arthropuosis (Scrofulous Inflammation of the Joints).

Order III.—Exanthemata (Eruptive Fevers).

Genus 25. Variola (Small-Pox).
Species 1. Discreta (Distinct).
2. Confluens (Confluent).

Genus 26. Varicella (Chicken-Pock).
27. Rubeola (Measles).
Species 1. Vulgaris (Common).
Variety 1. With Severe Symptoms.
2. With Cynanche.
3. With a Putrid Tendency.
Species 2. Variolodes (with Larger Papulæ).

Genus 28. Scarlatina (Scarlet Fever).
Species 1. Simplex (without Sore-Throat).
2. Cynanchica (with Ulcerating Sore-Thoat).

Genus 29. Pestis (the Plague).
30. Erysipelas (Rose-Fever).
Species 1. Vesiculosum (with Large Vesicles).
2. Phlyctœnodes (with Small Vesicles).

Genus 31. Miliaria (Miliary Eruption).
32. Urticaria (Nettle-Rash).
33. Pemphigus (Bleb).
34. Aphtha (Thrush).

Order IV.—Hæmorrhagiæ (Hæmorrhages).

Genus 35. Epistaxis (Bleeding at the Nose).
Species 1. Idiopathica (Idiopathic).
Variety 1. In the Young, with Arterial Plethora.
2. In the Old, with Venous Plethora.
Species 2. Symptomatica (Symptomatic).
Variety 1. From Internal Causes.
2. From External Causes.

Genus 36. Hæmoptysis (Bleeding from the Lungs).
Section 1. Idiopathic Species.
Species 1. Plethorica (from Plethora).
2. Violenta (from Violence).
3. Phthisica (from Phthisis).
4. Calculosa (with Calcareous Expectoration).
5. Vicaria (from Suppressed Evacuation).

Section 2. Symptomatic Species.
Species 1. Pneumonica (dependent on the Lungs).
2. Exanthematica (connected with Cutaneous Eruptions).
3. Hydropica (occasioned by Dropsy).
4. Cachectica (arising from Weakness).
Sequela. Phthisis (Pulmonary Consumption).
Species 1. Incipiens (without Purulent Expectoration).
2. Confirmata (with Purulent Expectoration).

Genus 37. Hæmorrhois (Bleeding from the Rectum).
Species 1. Tumens (from External Piles).
Variety 1. Cruenta (Sanguineous).
2. Mucosa (Mucous).
Species 2. Procidens (with Prolapsus Recti).
3. Fluens (from Internal Piles).
4. Cæca (without Discharge of Blood).

Genus 38. Menorrhagia (Bleeding from the Womb).
Species 1. Rubra (without Pregnancy).
2. Abortus (with Pregnancy).
3. Lochialis (after Delivery).
4. Vitiorum (from Local Disease).
5. Alba (Serous, without Pregnancy).
6. Nabothi (Serous, with Pregnancy).

Hæmorrhagiæ plerumque Symptomaticæ (Hæmorrhages generally Symptomatic).
1. Stomacace (Bleeding from the Gums).
2. Hæmatemesis (Bleeding from the Stomach).
3. Hæmaturia (Bleeding from the Urinary Passages).
4. Cystirrhagia (Bleeding from the Bladder).

Order V.—Profluvia (Discharges).

Genus 39. Catarrhus ("A Cold").
Species 1. A Frigore (from Cold).
2. A Contagio (from Contagion).

Genus 40. Dysenteria ("The Flux").
Variety 1. Accompanied by Worms.
2. With Fleshy Dejections.
3. Accompanied by Intermittent Fever.
4. Without Blood.
5. Accompanied by a Miliary Eruption.

CLASS II.

NEUROSES (NERVOUS DISEASES).

Order I.—Comata (Lethargic Affections).

Genus 41. Apoplexia (Apoplexy).

Section 1. Idiopathica (Idiopathic).

Species 1. Sanguinea (from Effusion of the Blood).
2. Serosa (from Effusion of Serum).
3. Hydrocephalica ("Water in the Head").
4. Atrabilaria (occurring in a Melancholy Temperament).
5. Traumatica (from Wounds).
6. Venenata (from Poisons).
7. Mentalis (from Mental Causes).
8. Cataleptica (attended by Catalepsy).
9. Suffocata (Asphyxia).

Section 2. Symptomatica (Symptomatic).
Species 1. With Intermittent Fever.
2. With Continued Fever.
3. With Inflammations.
4. With Eruptions.
5. With Hysteria.
6. With Epilepsy.
7. With Gout.
8. With Worms.
9. With Retention of Urine.
10. With Scurvy.

Genus 42. Paralysis (Palsy).

Section 1. Idiopathic Species.
Species 1. Partialis (confined to certain Muscles).
2. Hemiplegica (of one side of the Body).
Variety 1. In a Plethoric Habit.
2. In a Leucophlegmatic Habit.
Species 3. Paraplegica (of the Upper or Lower Half of the Body).
4. Venenata (from Poisons).

Section 2. Symptomatic Species.

Tremor.
Species 1. Asthenic.
2. Paralytic.
3. Convulsive.

Order II.—Adynamiæ (Diseases of Debility).

Genus 43. Syncope (Fainting).

Section 1. Idiopathic Species.
Species 1. Cardiaca (from Disease of the Heart).
2. Occasionalis (from Disease of the Whole System).
Section 2. Symptomatic Species.

Genus 44. Dyspepsia (Indigestion).

Section 1. Idiopathic Species.
2. Symptomatic Species.
Species 1. From Disease of the Stomach itself.
2. From Disease of Another Part.

Genus 45. Hypochondriasis ("The Vapours").
46. Chlorosis ("Green-Sickness").

Order III.—Spasmi (Spasms).

Section 1. Affecting the Animal Functions.

Genus 47. Tetanus (Locked-Jaw).
Variety 1. Tetanus (affecting the Whole Body).
2. Trismus (affecting the Lower Jaw).
Species 1. Nascentium (Affecting Infants).
2. Traumaticus (from Wounds).

Genus 48. Convulsio (Convulsion).
Species 1. Idiopathic.
2. Symptomatic.

Genus 49. Chorea ("St. Vitus's Dance").
50. Raphania ("Cripple-Disease").
51. Epilepsia ("Falling-Sickness").

Section 1. Cerebralis (without an Aura).
2. Sympathetica (with an Aura).
3. Occasionalis (from Irritation).

Variety 1. From Injury to the Head.
2. From Pain.
3. From Worms.
4. From Poison.
5. From a Repelled Eruption.
6. From Indigestion.
7. From Mental Emotion.
8. From Hæmorrhage.
9. From Debility.

Section 2. Affecting the Vital Functions.

Genus 52. Palpitatio (Palpitation).
53. Asthma (Asthma).
Species 1. Spontaneum (without Manifest Cause).
2. Exanthematicum (from a Repelled Eruption).
3. Plethoricum (from Plethora).

Genus 54. Dyspnœa (Difficult Respiration).
Division 1. Idiopathic Species.
Species 1. Catarrhalis (with Viscid Expectoration).
2. Sicca (without Expectoration).
3. Aerea (depending on the Weather).
4. Terrea (with Calculous Expectoration).
5. Aquosa (with Œdematous Feet).
6. Pinguedinosa (from Obesity).
7. Thoracica (from Thoracic Deformity).
8. Entrinseca (from External Causes).
Division 2. Symptomatic Species.
Species 1. In Disease of the Heart.
2. With an Abdominal Tumour.
3. In Various Diseases.

Genus 55. Pertussis (Hooping-Cough).

Section 3. In the Natural Functions.

Genus 56. Pyrosis ("Water-Brash").
57. Colica ("The Gripes").
Division 1. Idiopathic Species.
Species 1. Spasmodica (Common Colic).
Variety 1. Passio Ileaca (with Stercoraceous Vomiting).
2. Ileus (followed by Inflammation).
Species 2. Pictonum (arising from Lead).
3. Stercorea (from Constipation).
4. Accidentalis (from Acrid Ingesta).
5. Meconialis (from Retained Meconium).
6. Callosa (with Stricture of the Intestines).
7. Calculosa (with Intestinal Calculi).
Division 2. Symptomatic Species.

Genus 58. Cholera ("Bowel-Complaint").
Division 1. Idiopathic Species.
Species 1. Spontanea (Indian Cholera).
2. Accidentalis (from Acrid Ingesta).
Division 2. Symptomatic Species.

Genus 59. Diarrhœa ("Looseness").
Division 1. Idiopathic Species.
Species 1. Crupulosa (with Liquid Feces).
2. Biliosa (with Yellow Feces).
3. Mucosa (with Mucous Feces).
4. Cœliaca (with Dejections of Chyle).
5. Lienteria (with Dejections of Food).
6. Hepatirrhœa (with Dejections of Blood).
Division 2. Symptomatic Species.

Genus 60. Diabetes (Excess of Urine).
Division 1. Idiopathic Species.
Species 1. Mellitus (with Saccharine Urine).
2. Insipidus (with Insipid Urine).
Division 2. Symptomatic Species.

Genus 61. Hysteria (Hysterics).
Variety 1. From Amenorrhœa.
2. From Menorrhagia.
3. From Leucorrhœa.
4. From Visceral Obstruction.
5. From Disorder of the Stomach.
6. From Venereal Desire.

Genus 62. Hydrophobia (Dog-Madness).
Species 1. Rabiosa (with a Desire of Biting).
2. Simplex (without a Desire of Biting).

Order IV.—Vesaniæ (Mental Derangements).

Genus 63. Amentia (Idiocy).
Species 1. Congenita (from Malformation of the Brain).
2. Senilis (from Age).
3. Acquisita (from Accidental Causes).

Genus 64. Melancholia (Despondency).
Variety 1. With Excessive Dread of Disease.
2. Stultorum Paradisus (Fool's Paradise).
3. Erotomania (with Satyriasis or Nymphomania).
4. Religious Melancholy.
5. Pigritia (with Disinclination to Exertion).
6. With Restlessness and Impatience).
7. Tedium Vitæ (Weariness of Life).
8. Lycanthropia (prowling like a Wolf).

Genus 65. Mania (Madness).
Section 1. Idiopathic Species.
Species 1. Mentalis (from Suffering of the Mind).
2. Corporea (from Bodily Disorder).
3. Obscura (without Evident Cause).
Section 2. Symptomatic Species.
Species 1. From Poison.
2. From Fever.

Genus 66. Oneirodynia (Sleep-Walking).
Species 1. Activa (exciting to Motion).
2. Gravans (the "Night-Mare").

CLASS III.

CACHEXIÆ (DISEASES ARISING FROM A BAD HABIT OF BODY).

Order 1.—Marcores (Diseases of Emaciation).

Genus 67. Tabes (Emaciation with Hectic).
Species 1. Purulenta (from an Ulcer).
2. Scrofulosa (from Scrofula).
3. Venenata (from Poison).

Genus 68. Atrophia (Emaciation, without Hectic).
Species 1. Inanitorum (from Excessive Evacuation).
2. Famelicorum (from Deficient Nourishment).
3. Cacochymica (from Improper Food).

Order II.—Intumescentiæ (Enlargements).

Section 1. Adiposæ (Fatty Swellings).

Genus 69. Polysarcia (Excessive Obesity).

Section 2. Flatuosæ (Flatulent Swellings).

Genus 70. Pneumatosis (Emphysema).
Species 1. Spontanea (without Evident Cause).
2. Traumatica (from a Wound of the Chest).
3. Venenata (from Poison).
4. Hysterica (with Hysterics).

Genus 71. Tympanites (" Drum-Belly").
Species 1. Intestinalis (in the Intestines).
2. Abdominalis (in the Peritoneal Cavity).

Genus 72. Physometra (Flatus in the Womb).

Section 3. Aquosæ (Dropsies).

Genus 73. Anasarca (Subcutaneous Dropsy).
Species 1. Serosa (from Redundant Serum).
2. Oppilata (from Compression of the Veins).
3. Exanthematica (following Eruptive Diseases).
4. Anæmia (from Hæmorrhage).
5. Debilium (from General Weakness).

Genus 74. Hydrocephalus (Water in the Head).
75. Hydrorachitis (Spina Bifida).
76. Hydrothorax (Water in the Chest).
77. Ascites (Abdominal Dropsy).
Species 1. Abdominalis (in the Peritoneal Cavity).
Variety 1. From Compression of the Veins.
2. From Weakness.
3. From Tenuity of the Blood.
Species 2. Saccatus (in the Ovary).

Genus 78. Hydrometra (Uterine Dropsy).
79. Hydrocele (Water in the Tunica Vaginalis).

Section 4. Solidæ (Solid Tumours).

Genus 80. Physconia (Abdominal Tumour).
81. Rachitis (Rickets).

Order III.—Impetigines (Cachectic Spots).

Genus 82. Scrofula (" The King's-Evil").
Species 1. Vulgaris (in the Subcutaneous Glands).
2. Mesenterica (in the Mesenteric Glands).
3. Fugax (Temporary).
4. Americana (accompanying Frambœsia).

Genus 83. Syphilis (" The Pox").
84. Scorbutus (Scurvy).
85. Elephantiasis (Elephant-Leg).
86. Lepra (Leprosy).
87. Frambœsia (Yaws).
88. Trichoma (Polish Plait).
89. Icterus (Jaundice).

Section 1. Idiopathic Species.
Species 1. Calculosus (from Gall-Stones).
2. Spasmodicus (from Spasm of the Gall-Ducts).
3. Hepaticus (from Diseases of the Liver).
4. Gravidarum (from Pregnancy).
5. Infantum (arising soon after Birth).

Section 2. Symptomatic Species.

CLASS IV.

LOCALES (LOCAL DISEASES).

Order 1.—Dysæsthesiæ (Impaired Feelings).

Genus 90. Caligo (Cataract).
Species 1. Lentis (from Opacity of the Lens).
2. Corneæ (from Opacity of the Cornea).
3. Pupillæ (from Obstruction of the Pupil).
4. Humorum (from Depravity of the Aqueous Humour).
5. Palpebrarum (from Defect in the Eye-Lids).

Genus 91. Amaurosis (Nervous Blindness).
Species 1. Compressionis (from Cerebral Congestion).
2. Atonica (from Debility).
3. Spasmodica (from Spasm).
4. Venenata (from Poison).

Genus 92. Dysopia (Depraved Vision).
Species 1. Tenebrarum (requiring a Strong Light).
2. Luminis (requiring a Weak Light).
3. Dissitorum (not seeing Distant Objects).
4. Proximorum (not seeing Near Objects).
5. Lateralis (seeing only Objects situated Obliquely).

Genus 93. Pseudoblepsis (False Vision).
Species 1. Imaginaria (seeing Unreal Objects).
2. Mutans (seeing Real Objects in Unreal Shapes).

Genus 94. Dysecœa (Deafness).
Species 1. Organica (from Structural Disease of the Ear).
2. Atonica (without Structural Disease of the Ear).

Genus 95. Paracusis (Depraved Hearing).
Species 1. Imperfecta (hearing Real Sounds incorrectly).
2. Imaginaria (hearing Unreal Sounds).

Genus 96. Anosmia (Loss of Smell).
Species 1. Organica (from Disease of the Schneiderian Membrane).
2. Atonica (without Disease of the Schneiderian Membrane).

Genus 97. Ageustia (Loss of Taste).
Species 1. Organica (from Structural Disease of the Tongue).
2. Atonica (without Structural Disease of the Tongue).

Genus 98. Anæsthesia (Loss of Touch).

Order II.—Dysorexiæ (Impaired Appetites).

Section 1. Depraved Appetites.

Genus 99. Bulimia (Voracity).
Division 1. Idiopathic Species.
Species 1. Helluonum (without Disease of the Stomach).
2. Syncopalis (from Hunger threatening Syncope).
3. Emetica (followed by Vomiting).
Division 2. Symptomatic Species.

Genus 100. Polydipsia (Excessive Thirst).
101. Pica (Dirt-Eating).
102. Satyriasis (Excessive Venereal Desire in Males).
Species 1. Juvenalis (without Disorder of the System).
2. Furens (with Disorder of the System).

Genus 103. Nymphomania (Excessive Venereal Desire in Females).
104. Nostalgia (Home-Sickness).
Species 1. Simplex (without Other Diseases).
2. Complicata (with Other Diseases).
Section 2. Deficient Appetites.
Genus 105. Anorexia (Want of Appetite for Food).
Species 1. Humoralis (from Humours in the Stomach).
2. Atonica (from Weakness of the Stomach).
Genus 106. Adipsia (Want of Thirst).
107. Anaphrodisia (Want of Venereal Desire).

Order III.—Dyscinesiæ (Difficult Motions).
Genus 108. Aphonia (Loss of Voice).
Species 1. Gutturalis (from Swelling of the Throat).
2. Trachealis (from Compression of the Trachea).
3. Atonica (from Division of the Laryngeal Nerves).
Genus 109. Mutitas (Dumbness).
Species 1. Organica (from Disease of the Tongue).
2. Atonica (from Disease of the Nerves).
3. Surdorum (from Deafness).
Genus 110. Paraphonia (Impaired Voice).
Species 1. Puberum (from Puberty).
2. Rauca (Hoarseness).
3. Resonans (with Obstruction of the Nostrils).
4. Palatina (from Cleft-Palate).
5. Clangens (with a Ringing-Sound).
6. Comatosa (from Relaxation produced by Coma).
Genus 111. Psellismus (Stammering).
Species 1. Hæsitans (with Frequent Repetitions).
2. Ringens (aspirating the Letter "R").
3. Lallans (pronouncing "R" like "L").
4. Emolliens (changing Letters into "S").
5. Balbutiens (a Redundancy of Labial Letters).
6. Acheilos (a Deficiency of Labial Letters).
7. Lagostomatum (a Defect in Guttural Letters).
Genus 112. Strabismus (Squinting).
Species 1. Habitualis (from Using only One Eye).
2. Commodus (from the Greater Mobility of One Eye).
3. Necessarius (from a Change in the Eye itself).
Genus 113. Dysphagia (Difficult Deglutition).
114. Contractura (Contraction of the Limbs).
Species 1. Primaria (from Contraction of the Muscles).
Variety 1. From Inflammation.
2. From Spasm.
3. From Palsy of the Antagonist Muscles.
4. From Irritation.
Species 2. Articularis (from Rigidity of the Joints).

Order IV.—Apocenoses (Excessive Discharges).
Genus 115. Profusio (a Flow of Blood).
116. Ephidrosis (Excess of Perspiration).
117. Epiphora (Lachrymation).
Species 1. Idiopathic.
2. Symptomatic.
Genus 118. Ptyalismus (Salivation).
Species 1. Idiopathic.
2. Symptomatic.

Genus 119. Enuresis (Involuntary Flow of Urine).
Species 1. Atonica (from Disease of the Sphincter of the Bladder).
2. Irritata (from Irritation of the Bladder).

Genus 120. Gonorrhœa (Preternatnral Discharge from the Urethra).
Species 1. Pura (without Impure Connexion).
2. Impura (after Impure Connexion).
Sequela. Gonorrhœa Mucosa (a Gleet).
Species 3. Laxorum (without Erection, but with Venereal Desire).
4. Dormientium (a Discharge of Semen while Asleep).

Order V.—Epischeses (Retained Excretions).

Genus 121. Obstipatio (Costiveness).
Species 1. Debilium (from Weakness).
2. Rigidorum (in Persons of a Rigid Fibre).
3. Obstructorum (with Colic).

Genus 122. Ischuria (Retention of Urine).
Species 1. Renalis (arising from the Kidney).
2. Uretica (arising from the Ureter).
3. Vesicalis (arising from the Bladder).
4. Urethralis (arising from the Urethra).

Genus 123. Dysuria (Difficulty in passing Urine).
Species 1. Ardens (accompanied by Heat).
2. Spasmodica (from Spasm).
3. Compressionis (from Pressure).
4. Phlogistica (from Inflammation).
5. Irritata (from Urinary Calculi).
6. Mucosa (with a copious Excretion of Mucus).

Genus 124. Dyspermatismus (Difficult Emission of Semen).
Species 1. Urethralis (from Disease of the Urethra).
2. Nodosus (from Nodes of the Corpora Cavernosa).
3. Præputialis (from a Narrow Orifice of the Prepuce).
4. Mucosus (from Mucus obstructing the Urethra).
5. Hypertonicus (from a too Vigorous Erection).
6. Epilepticus (from an Epileptic Spasm).
7. Apractodes (from Inactivity of the Genital Organs).
8. Refluus (from the Semen flowing into the Bladder).

Genus 125. Amenorrhœa (Deficiency of the Catamenia).
Species 1. Emansionis (Non-Appearance at Puberty).
2. Suppressionis (Disappearance after their Establishment).
3. Difficilis (Sparing and Painful Evacuation of the Menses).

Order VI.—Tumores (Tumors).

Genus 126. Aneurysma (Aneurism).
127. Varix (Partial Dilatation of a Vein).
128. Ecchymoma (Diffusion of Blood).
129. Scirrhus (Malignant Induration).
130. Cancer (Ulcerated Schirrus).
131. Bubo (a Suppurating Tumor of a Gland).
132. Sarcoma (a Fleshy Tumor).
133. Verruca (a Wart).
134. Clavus (a Corn).
135. Lupia (an Encysted Tumor).
136. Ganglion (a Tumor on a Tendon).
137. Hydatis (Bladder-Worm).
138. Hydrarthrus (White-Swelling).
139. Exostosis (a Bony Tumor).

Order VII.—Ectopiæ (Dislocations).

Genus 140. Hernia (a Covered Dislocation of a Soft Part).

Genus 141. Prolapsus (a Naked Dislocation of a Soft Part).
142. Luxatio (a Dislocation of a Hard Part).

Order VIII.—Dialyses (Solutions of Continuity).

Genus 143. Vulnus (a Wound).
144. Ulcus (an Ulcer).
145. Herpes (Tetter, or Shingles).
146. Tinea (Scald-Head, or Ringworm).
147. Psora ("the Itch").
148. Fractura (a Fracture).
149. Caries (Ulceration of a Bone).

No. II.

COAGULATION OF THE BLOOD.

Blood coagulates, when it has escaped from the body, whether it be warm or cold, in the air or in vacuo, diluted (within certain limits) or undiluted, at rest or in motion. While within the vessels, rest (which causes a cessation of intercourse between the motionless portion and the general mass) always disposes it to coagulate. Yet its coagulation, after escaping from the body, is said to be accelerated by motion; by a high temperature; by a vessel calculated to preserve its heat; by a vacuum; by the stream from the blood-vessel being slow; and, in short, by every circumstance which favours the escape of carbonic-acid-gas. Professor Brande obtained two cubic inches of carbonic acid from every ounce of blood; but Dr. Scudamore less than half a cubic inch from six ounces. The quantity is said to be much greater after a meal, and much less when the blood is buffy. It is said to be proportioned to the quantity of carbonic-acid-gas evolved;—the latter being given off during the coagulation, and ceasing to escape when the coagulation is complete. Galvanism and oxygen-gas raise the temperature of blood, and hasten its coagulation; while carbonic-acid-gas, nitrogen, and hydrogen, have opposite effects. The coagulation of the blood is ascribed, by John Hunter, to its life; by Mr. Thackrah, on the contrary, to its death;—because the separation of a portion of the blood from the whole mass, by its escaping from a vessel, is likely to kill it if alive; because every change likely to impair life (such as debility and fainting) promotes coagulation; and because blood frozen (which process is likely to kill it if alive) and again thawed, instantly coagulates. But if Dr. Scudamore's experiments be accurate,—though others have not found the same results,—coagulation appears, in most cases, to be attributable merely to the escape of carbonic acid; and as coagulated blood, or fibrin, becomes vascular, we can hardly (if the fluid be alive) regard a coagulum as necessarily dead. Large quantities of blood are found fluid, in every dead body;—showing that the simple loss of vitality is not sufficient to cause coagulation. Indeed, the blood of the heart and vessels is found, most frequently, in opposite states;—fluid in one part, and coagulated in another; yet it is all equally dead. From all these contradictory circumstances, I regard the coagulation of the blood as quite unconnected with its vitality or its lifelessness, and as entirely a chemical result. That it is influenced, however, by the vital properties of the containing vessels, is possible; but these properties may operate upon the blood, in this respect, as a mere chemical compound; and even if it be alive, and they influence its life, still the influence, as far as respects coagulation, may in effect be chemical.

The blood generally coagulates in the living body, on escaping from its vessels, and even in its vessels, if its motion be prevented by ligatures. When it does not, its subsequent escape from the body almost always produces instant coagulation. John Hunter mentions the coagulation of blood let out from the tunica vaginalis;

in which it had lain fluid for sixty-five days after a wound. It almost always coagulates, likewise, in the vessels which run through healthy parts to others in a state of mortification; and in large vessels adjoining a pulmonary abscess;—in which cases, the *final* cause is prevention of hæmorrhage. The *efficient* cause, however, in all these examples, is unknown. In all of them, the blood is still in contact with living parts; and in the two last, it is not at rest till it coagulates. John Hunter mentions that, after mortification of the foot and leg, he found the crural and iliac arteries completely filled with strongly coagulated blood; and adds, that this could not have arisen from rest; because, if that were the case, the same thing ought to happen in amputation, or in any case where the larger vessels are tied up. Besides, coagulation after extravasation, or when a portion of blood in a vessel is included between two ligatures, is not an invariable occurrence. These facts, in addition to those stated above, show that fluidity or coagulation is not dependent on the simple presence or absence of vitality. Whatever connexion coagulation *out* of the body may have with the escape of carbonic acid gas, there is no proof of it in the case of coagulation *in* the body. Some have thought that heat is evolved during the coagulation of the blood; while others have denied it. The latest experimenter (Scudamore) supports the opinion.

To suppose an affinity of the red particles for either the lymph or the serum, is erroneous. Leewwenhock and Hartsoeker long since proved, that serum merely suspends them; for if, when separated, they be triturated with serum, part of them is taken up, and the serum assumes a red colour; but if the fluid be allowed to settle in a cylindrical glass, they slowly precipitate themselves to the bottom; and the serum above becomes clear as before. When blood is drawn, the *serum* easily separates on the coagulation of the lymph; but the *lymph* coagulates before the colouring particles have time to fall to the bottom; and, from entangling them, acquires a red colour;—thus forming the crassamentum. If, however, the lymph be thinner, and coagulate slowly, (as in the case of a phlogistic diathesis, and pregnancy), the greater specific gravity of the cruor, detaches it very considerably from the lymph, which remains colourless above;—constituting what is called the inflammatory coat, crust, or buff. Berzelius even believes the lymph to be in a state of solution in the serum, while the cruor is simply suspended in this solution. In the phlogistic diathesis, both the fibrin and the serum are more abundant, and the blood lighter. Thinness of the blood, and a disposition to slow coagulation, generally co-exist. But the rapidity of the stream greatly affects the rate of coagulation; so that one portion of the same blood *coagulates slowly* when *drawn quickly*, and another *quickly* when drawn *slowly*.

The appearance of the buffy coat, does not *arise* from slow coagulation; though *increased* by it; for, of two portions of the same blood, one has afforded no buffy coat; although it remained fluid at least ten minutes after the buffy coat began to be formed on the other. If, as appears from Mr. Hewson's experiments, the buffy coat arise from the thinness of the fibrin, while the red particles continue of their usual weight,—the above circumstance proves, that slow coagulation is not altogether dependent on mere thinness of the blood, though generally connected with it, and proportional to it. Yet, when the blood is thin, rapid coagulation, by means of a slow stream, may prevent the formation of a buffy coat;—by not allowing time for the difference between the weight of the fibrin, and that of the red particles, to effect a separation. The stirring of such blood has the same consequence; and the slower the coagulation of thin blood, (occasioned, for instance, by rapid bleeding), the greater will be the buffy coat. The different cups of blood drawn in an inflammatory disease, may vary as to the buffy coat, according to accidental variations in the stream; but generally it is the *first* cup that abounds in buff, and frequently the *last* has none. This occurs when there is no difference in the stream; so that if the buff arise from thinness of the serum, we must conclude (with Hewson) that its qualities may be changed even during bleeding. Dr. Scudamore finds much more fibrin in buffy blood; and consequently concludes that, not merely the *thinness* of the blood (as Hewson found), but likewise its *quantity* may vary during the flow of blood. The greater the strength of the patient, and the intensity of the inflammation, the firmer is

the coagulum of fibrin, and the more cupped its appearance. Dr. Scudamore did not find a buffy coat in blood drawn immediately after violent exercise.

The blood of different brutes coagulates in different periods of time. Mr. Thackrah imagines the rapidity of coagulation to be inversely as the strength and size of the animal. Thus while healthy human blood coagulates in from three to four minutes, the blood of the horse and the ox coagulates in from two to fifteen; that of dogs, sheep, rabbits, and fowls, in from half a minute to three minutes; and in mice and fish in a moment.—*Dr. Elliotson's Translation of Blumenbach's "Elements of Physiology;" Fourth Edition; Pages* 12 *to* 15.

No. III.

CIRCULATION OF THE BLOOD.

Most physiologists grant to the capillaries irritability, tonicity, or organic contractility; but some deny that *arteries* possess muscular properties. Bichat's objections are,—the absence of contraction on the application of the stimuli to them; the much greater resistance of the middle coat, than of muscular parts to a distending force; and, lastly, the difference between the changes it undergoes, and those which are undergone by muscles,—both spontaneously and from the action of other substances. Berzelius has multiplied the latter description of proofs. However this may be, I must remark, in the first place, that the capillaries certainly have vital powers of contraction, as fully as any parts of the body. This appears in their various degrees of *local* dilatation and contraction, from inflammation, passions of the mind, &c. When different stimuli are applied to them, they are seen (by the aid of the microscope) to experience various degrees of contraction and dilatation; and this even after connexion with the heart has been cut off, by absolute extirpation of that organ. In similar circumstances, when a new stimulus was applied, the blood was often seen, by Dr. Hastings, to cease to flow, but still to oscillate. If the capillaries be allowed to possess organic contractility, it is impossible to say at what point of the arterial tract that property begins to be possessed.

Evident muscular fibres are not necessary to irritability. The iris and the uterus are strongly endowed with this property; but their muscularity is disputed by many. No muscularity is discernible in the plant called *Dionæa Muscipula*, or in "the sensitive-plant," or in those zoophytes which appear to be mere gelatinous masses; yet contractility dependent on life is very manifest in them. Verschuir actually found the larger arteries contract on irritating them with a scalpel, in fifteen out of twenty experiments. Dr. L. Bikker, and J. J. Vandembos, assert the same of the aorta, and Van Geuns of the carotid, when influenced by electricity. Zimmerman, Bichat, and Magendie, saw the arteries contract upon the application of acids; but the two last considered it to be *chemical* change. Dr. Hastings, however, saw the same from the application of ammonia. John Hunter found the posterior or tibial artery of a dog contract, so as nearly to prevent any blood from passing through it, on merely being laid bare; and facts similar to this are mentioned by Drs. Hastings, Fowler, Jones, and Parry. The fact, therefore, that continued contraction, and alternate contraction and relaxation, are occasioned in arteries by the application of stimuli, is certain; and although some have not succeeded in stimulating them, we must remember that others have failed in the application of electricity to parts indisputably muscular; Verschuir, for instance, in the case of the heart and urinary bladder, and Zimmerman in other parts of known muscularity. Dr. Hastings caused contraction in *veins*, as well as arteries, by the application of stimuli.

Dr. Parry instituted a number of experiments on this question. After exactly ascertaining the circumference of arteries in animals, he killed them, and again

measured the circumference; after a lapse of many hours, when life must have been perfectly extinguished, he measured the circumference a third time. Immediately after death, the circumference was found greatly diminished; and, on the third examination, it had increased again. The first contraction arose from the absence of the blood, which had distended the vessel, and antagonized its efforts to contract. It was evidently *muscular* (or, to speak correctly, *organic*) contraction; because when vitality had ceased, and this kind of contraction could no longer exist, the vessel, on the third examination, was always found enlarged. The forced state of distention in arteries, was proved by the contraction which immediately occurred on making a puncture in a portion of a vessel included between two ligatures. An experiment of Magendie's has equal weight. He fixed a ligature on the whole of a dog's leg, except the crural artery and vein. The two latter were then compressed; and, upon wounding the *vein*, the *artery* completely emptied itself. The capacities of arteries are thus always accomodated to the quantity of blood they have to contain; and this circumstance enables the arterial canal to partake so much of the properties of a rigid tube, that an impulse at the mouth of the aorta, is instantly communicated throughout the canal. This appears to be the great design of the contractile power of arteries; for they do not incessantly dilate and contract to any amount,—as many imagine. Dr. Parry, on the most careful examination, could never discover the least dilatation in them, during the systole of the ventricle,—when the pulse is felt. Dr. Hastings declares he has seen it, as does also Magendie, in the case of the aorta and carotid of the horse; but, from the number and accuracy of Dr. Parry's experiments, I incline to believe it does not occur, to any considerable extent, in the ordinary undisturbed state of the circulation. Dr. Parry plunged his arm into the thorax of a horse, and found the aorta constantly full, nearly to bursting, and not perceptibly varying in distention for an instant; though he held it during five minutes, and examined it afterwards again. The vena cava, on the other hand, was so empty at every expiration, as to feel only like a flaccid thin membrane. The fact that, from a wounded artery, there is a *continued* stream, only *augmented* at each pulsation of the heart, is thought by Megendie to prove that the arteries assist in propelling the blood; but an opening takes off so much of the resistance to the course of the blood, that the vessel cannot but contract between the impulses of the heart.

Although the blood is constantly streaming onwards, the pulse is felt only when arteries are more or less compressed; in which case the progress of the blood, which is forced onwards by the impulse of a fresh portion from the left verticle, is impeded; and this effort of the fluid against the obstructing cause, gives the sensation called "the pulse." The pulse follows the stroke of the heart, later and later as the arteries recede from the heart; though the interval is, in general, too minute to be appreciated. Dr. Barry found no pulsation in the aorta of the horse, unless he compressed it violently. The elastic coat both *assists* and *antagonizes* the muscular;—assists it in preventing distention, when the distending process is very strong, and antagonizes it (tends to prevent the canal from becoming too narrow) when it attempts to contract the vessel excessively. Independently of the whole quantity of blood, and of the heart's action, particular arteries may be in various degrees of distention, according to the various states of their individual contraction. When there is a whitlow on a finger, for example, the digital branches are found larger than usual at the very roots of the fingers; and, in many affections, the pulse differs for a time in the two wrists. In fact, the condition of the arteries may vary like that of the capillaries; and probably it does vary, every time that the circulation in a part is altered; although Dr. Parry's opinion holds true during the tranquil and ordinary condition of the circulation. I am thus inclined both to agree with and to differ from Dr. Parry and Dr. Hastings; for I believe the former is right as to the ordinary state of the circulation, and the latter as to any irregularity. The *elastic* power is said to be greater in the arteries, and the *muscular* in the capillaries; and as the *muscular* power is proved, by Dr. Parry's experiments, to be able to overcome the *elastic* power in the *arteries*, it must be very considerable in the *capillaries*.

Dr. Curry, the late Senior Physician, and distinguished Lecturer of the Practice of Medicine at Guy's Hospital, concluded (without doubt, hypothetically) that

the circulation is indispensably facilitated by a sort of electric repulsion between the blood-vessels and their contents; and that, in an inflammatory accumulation, —the tone of the vessels being impaired,—this repulsion is diminished; and the blood, in consequence, passes onwards with difficulty. He grounded this opinion on some microscopic experiments on inflammation, which he had made in the presence once of Mr. Charles Bell, and once of Mr. Travers.

Although *variations* of dilatation in vessels, must affect the course of the blood through them, it is difficult to conceive how any *regular* action of them can assist it, while the blood is propelled and drawn by the heart. In some microscopical experiments, in which obstruction was produced, the influence of the heart was seen, by Dr. Hastings, to extend to arteries, capillaries, and veins; for the blood in them all received a sensible impulse, at each contraction of the verticles. Indeed we have ocular proof that, in the ordinary state of things, the capillaries do not contract on the blood; for the blood in them, as well as in the arteries and veins may be seen (in a frog's foot under a microscope) to move in an unvarying stream, for an hour together; neither becoming finer alternately, nor experiencing impulses.

In fœtuses without hearts, it is not proved that the muscular system carries on the circulation by its own power; because a twin without a heart has never been seen, unless accompanied by a perfect fœtus, the heart of which might circulate the blood of both. The placentæ often communicate; so that one child has died of hæmorhage from the umbilical cord of the other; and, in the only instance in which the matter was ascertained, the fœtus which was without a heart, was actually injected through the navel-string of the perfect fœtus. When, however, the blood is not moved by the heart, the capillaries do impel it. Dr. Wilson Philip once saw it moving freely in the mesenteric capillaries of a rabbit, for an hour and a quarter after the excision of the heart. Haller and Bichat made similar observations. Mr. Burns, anxious to prove that the arteries are of more importance than the heart, and that they themselves circulate the blood which they receive, mentions one among other examples of diseased heart, in which both ventricles (except about a cubic inch at the apex) were as completely ossified as the cranium. In this case there had been no palpitation or pain in the heart; but as bony ventricles cannot contract, or be easily moved, palpitation could not readily have occurred, and pain rarely attends the ossification of any part. That the circulation was deranged, is proved by the woman having experienced great dyspnœa, and expectoration, and dropsy. The auricles were healthy, and thicker than usual; and had evidently performed the duty of the ventricles; through which, as an unchanging reservoir between the auricles and the pulmonary artery and aorta, the auricles drove the blood. The invariable langour of the circulation, in cases where the action of the heart is languid, proves the power of the heart in the circulation. On the other hand, the large arteries of the extremities are continually found ossified, without any apparent deficiency in the circulation. I have seen long tracts of vessels in the lower extremities ossified, where no such circumstance had been suspected. Mr. Burns himself mentions an instance of the arteries of the head, pelvis, legs, and arms being almost entirely ossified, while the heart and aorta were healthy; and yet the man clearly died of diseased liver, induced by hard living, a hot climate, &c.—*Elliotson's "Blumenbach;" Fourth Edition*; *Pages* 100 *to* 106.

No. IV.

DR. FLETCHER'S PHYSIOLOGICAL CLASSIFICATION OF DISEASES.

FIRST DIVISION.

ORGANIC DISEASES.

INFLAMMATION.

I. *Respiratory Organs.*—1. Laryngitis. 2. Cynanche Trachealis. 3. Bronchitis. 4. Peripneumonia. 5. Peripneumonia Notha. 6. Pleuritis.

II. *Circulating Organs.*—1. Carditis. 2. Rheumatism of the Heart. 3. Pericarditis. 4. Arteritis. 5. Phlebitis. 6. Splenitis.

III. *Digestive Organs.*—1. Cynanche Pharyngea. 2. Inflammation of the Gullet. 3. Gastro-Enteritis. 4. Hepatitis. 5. Inflammation of the Pancreas. 6. Peritonitis.

IV. *Urinary Organs.*—1. Nephritis. 2. Cystitis.

V. *Genital Organs.*—1. Orchitis. 2. Hysteritis. 3. Inflammation of the Mamma.

VI. *Nostrils, Eyes, Ears, and Mouth.*—1. Ophthalmia Tarsi. 2. Ophthalmia Membranorum. 3. Iritis. 4. Otitis. 5. Cynanche Parotidea. 6. Cynanche Tonsillaris. 7. Glossitis. 8. Parulis. 9. Odontalgia.

VII. *Integuments.*—1. Strophulus. 2. Lichen. 3. Prurigo. 4. Rubeola. 5. Scarlatina. 6. Urticaria. 7. Roseola. 8. Erythema. 9. Furunculus. 10. Anthrax. 11. Phlegmasia Dolens.

VIII. *Organs of Thought.*—1. Myelitis. 2. Neuralgia. 3. Encephalitis. 4. Arachnitis.

IX. *Organs of Voluntary Motion.*—1. Inflammation of the Bones. 2. Periostitis. 3. Inflammation of the Ligaments. 4. Rheumatism. 5. Gout.

INDURATION, HYPERTROPHY, AND STRICTURE.

I. *Respiratory Organs.*—1. Enlarged Bronchi. 2. Hepatization of the Lungs.

II. *Circulating Organs.*—1. Induration of the Heart. 2. Hypertrophy of the Heart. 3. Aneurism of the Heart. 4. True Aneurism of the Arteries. 5. Varix of the Veins (Cirsocele, Varicocele, &c.). 6. Varix of the Thoracic Duct. 7. Stricture of the Apertures of the Heart (Cyania). 8. Stricture of the Arteries (Dry Gangrene). 9. Stricture of the Veins. 10. Stricture of the Thoracic Duct. 11. Induration of the Spleen. 12. Hypertrophy of the Spleen.

III. *Digestive Organs.*—1. Stricture of the Gullet. 2. Stricture of the Pylorus. 3. Stricture of the Gall-Ducts. 4. Stricture of the Colon. 5. Stricture of the Rectum. 6. Induration of the Liver. 7. Hypertrophy of the Liver. 8. Induration of the Pancreas. 9. Hypertrophy of the Pancreas.

IV. *Urinary Organs.*—1. Hypertrophy of the Bladder. 2. Stricture of the Urethra.

V. *Genital Organs.*—1. Induration of the Testicles. 2. Hypertrophy of the Testicles. 3. Induration of the Vesiculæ Seminales. 4. Hypertrophy of the Vesiculæ Seminales. 5. Induration of the Prostate Gland. 6. Hypertrophy of the Prostate Gland. 7. Induration of the Scrotum. 8. Hypertrophy of the Scrotum. 9. Induration of the Uterus. 10. Hypertrophy of the Uterus. 11. Induration of the Labia. 12. Hypertrophy of the Labia. 13. Stricture of the Vas Deferens. 14. Stricture of the Fallopian Tube.

VI. *Nostrils, Eyes, Ears, and Mouth.*—1. Induration of the Cornea (Leucoma, Albugo, &c.). 2. Hypertrophy of the Cornea (Staphyloma, &c.). 3. Induration of the Lens (Cataract). 4. Hypertrophy of the Lens. 5. Induration of the Vitreous Humour (Glaucoma). 6. Hypertrophy of the Vitreous Humour. 7. Stricture of the Nasal Duct (Fistula Lachrymalis). 8. Fistula of the Eustachian Tube.

VII. *Integuments.*—1. Induration of the Cuticle. 2. Hypertrophy of the Cuticle (Lepra, Psoriasis, Plica Polonica, Pityriasis, and Icthyosis). 3. Induration of the Cutis. 4. Hypertrophy of the Cutis (Vitiligo and Elephantiasis). 5. Induration of the Cellular Tissue. 6. Hypertrophy of the Cellular Tissue (Barbadoes-Leg and Scleroma).

VIII. *Organs of Thought.*—Induration of the Brain.

IX. *Organs of Voluntary Motion.*—1. Hyperostosis. 2. Exostosis. 3. Anchylosis.

POLYPI, TEETH, &c.

I. *Respiratory Organs.*—Polypi of the Bronchi.

II. *Circulating Organs.*—Polypus of the Heart.

III. *Digestive Organs.*—1. Polypus of the Gullet. 2. Polypus of the Stomach. 3. Polypus of the Colon. 4. Polypus of the Rectum. 5. Teeth, &c. in the Stomach.

IV. *Urinary Organs.*—1. Polypi of the Bladder. 2. Polypi of the Urethra. 3. Teeth, &c. in the Kidney. 4. Teeth, &c. in the Bladder.

V. *Genital Organs.*—1. Polypi of the Uterus. 2. Teeth, &c. in the Testicle. 3. Teeth, &c. in the Uterus. 4. Teeth, &c. in the Ovary.

VI. *Nostrils, Eyes, Ears, and Mouth.*—1. Polypi of the Nostrils. 2. Polypi of the Curuncula Lachrymalis (Encanthis, Pterygium, &c.).

ADHESION.

I. *Respiratory Organs.*—Adhesion of the Pleura.

II. *Circulating Organs.*—Adhesion of the Pericardium.

III. *Digestive Organs.*—Adhesion of the Peritoneum.

IV. *Genital Organs.*—Adhesion of the Tunica Vaginalis.

V. *Organs of Thought.*—Adhesion of the Arachnoid Coat.

OSSIFICATION.

I. *Respiratory Organs.*—1. Ossification of the Laryngeal Cartilages. 2. Ossification of the Pleura.

II. *Circulating Organs.*—1. Ossification of the Heart. 2. Ossification of the Pericardium. 3. Ossification of the Arteries. 4. Ossification of the Veins. 5. Ossification of the Conglohate Glands. 6. Ossification of the Spleen.

III. *Digestive Organs.*—1. Ossification of the Gullet. 2. Ossification of the Stomach. 3. Ossification of the Gall-Ducts. 4. Ossification of the Peritoneum.

IV. *Genital Organs.*—1. Ossification of the Testicle. 2. Ossification of the Tunica Vaginalis. 3. Ossification of the Uterus. 4. Ossification of the Ovary.

V. *Organs of Thought.*—1. Ossification of the Spinal Marrow. 2. Ossification of the Brain. 3. Ossification of the Arachnoid Coat.

VI. *Organs of Voluntary Motion.*—Ossification of the Tendons.

HYDATIDS.

I. *Respiratory Organs.*—Hydatids in the Bronchi.

II. *Circulating Organs.*—1. Hydatids in the Heart. 2. Hydatids in the Spleen. 3. Hydatids in the Thyroid Gland.

III. *Digestive Organs.*—1. Hydatids in the Liver. 2. Hydatids in the Peritoneum.

IV. *Urinary Organs.*—Hydatis in the Kidney.

V. *Genital Organs.*—1. Hydatids in the Uterus (Hydrometra). 2. Hydatids in the Fallopian Tube.

VI. *Organs of Thought.*—1. Hydatids in the Brain. 2. Hydatids in the Arachnoid Coat.

VII. *Organs of Voluntary Motion.*—1. Hydatids in the Bones. 2. Hydatids in the Muscles.

WORMS.

I. *Respiratory Organs.*—Worms in the Bronchi.

II. *Digestive Organs.*—1. Worms in the Intestines. 2. Worms in the Gall-Ducts.

III. *Urinary Organs.*—1. Worms in the Kidney. 2. Worms in the Bladder.

IV. *Genital Organs.*—Worms in the Ovary.

V. *Nostrils, Eyes, Ears, and Mouth.*—Worms under the Tunica Adnata.

VI. *Integuments.*—Worms under the Skin.

TUBERCLES.

I. *Respiratory Organs.*—1. Tubercles in the Lungs. 2. Tubercles in the Pleura.

II. *Circulating Organs.*—1. Tubercles in the Heart. 2. Tubercles in the Pericardium. 3. Tubercles in the Conglobate Glands. 4. Tubercles in the Spleen.

III. *Digestive Organs.*—1. Tubercles in the Stomach. 2. Tubercles in the Intestines. 3. Tubercles in the Liver. 4. Tubercles in the Pancreas. 5. Tubercles in the Peritoneum.

IV. *Urinary Organs.*—Tubercles in the Kidney.

V. *Genital Organs.*—1. Tubercles in the Testicle. 2. Tubercles in the Uterus. 3. Tubercles in the Ovary. 4. Tubercles in the Mamma.

VI. *Organs of Thought.*—1. Tubercles in the Spinal Marrow. 2. Tubercles in the Brain. 3. Tubercles in the Arachnoid Coat.

VII. *Organs of Voluntary Motion.*—Tubercles in the Bones.

ENCEPHALOID TUMOURS.

I. *Respiratory Organs.*—Encephaloid Tumour of the Lungs.

II. *Digestive Organs.*—Encephaloid Tumour of the Stomach.

III. *Genital Organs.*—1. Encephaloid Tumour of the Testicle. 2. Encephaloid Tumour of the Ovary. 3. Encephaloid Tumour of the Mamma.

IV. *Nostrils, Eyes, Ears, and Mouth.*—Encephaloid Tumour of the Eye.

V. *Integuments.*—Encephaloid Tumour of the Dermoid Tissue.

VI. *Organs of Thought.*—1. Encephaloid Tumour of the Spinal Marrow. 2. Encephaloid Tumour of the Brain.

VII. *Organs of Voluntary Motion.*—Encephaloid Tumour of the Bones.

SCIRRHUS.

I. *Circulating Organs.*—1. Scirrhus of the Heart. 2. Scirrhus of the Thyroid Gland.

II. *Digestive Organs.*—1. Scirrhus of the Gullet. 2. Scirrhus of the Cardia. 3. Scirrhus of the Pylorus. 4. Scirrhus of the Colon. 5. Scirrhus of the Rectum.

III. *Urinary Organs.*—Scirrhus of the Kidney.

IV. *Genital Organs.*—1. Scirrhus of the Testicle. 2. Scirrhus of the Scrotum. 3. Scirrhus of the Penis. 4. Scirrhus of the Mamma.

V. *Nostrils, Eyes, Ears, and Mouth.*—1. Scirrhus of the Nostrils. 2. Scirrhus of the Parotid Gland. 3. Scirrhus of the Tongue. 4. Scirrhus of the Lips.

VI. *Organs of Thought.*—1. Scirrhus of the Spinal Marrow. 2. Scirrhus of the Brain.

CALCULI.

I. *Respiratory Organs.*—Calculi in the Bronchi.

II. *Circulating Organs.*—Calculi in the Heart.

III. *Digestive Organs.*—1. Calculi in the Intestines. 2. Calculi in the Gall-Ducts (Jaundice). 3. Calculi in the Pancreatic Duct.

IV. *Urinary Organs.*—1. Calculi in the Kidney. 2. Calculi in the Bladder. 3. Calculi in the Urethra.

V. *Genital Organs.*—1. Calculi in the Prostate Gland. 2. Calculi in the Vesiculæ Seminales. 3. Calculi in the Uterus.

VI. *Nostrils, Eyes, Ears, and Mouth.*—Calculi in the Salivary Ducts (Ranula).

VII. *Organs of Voluntary Motion.*—Calculi in the Bursæ Mucosæ.

DERANGED SECRETIONS.

I. *Circulating Organs.*—1. Adipose Tumour of the Heart. 2. Bronchocele.

II. *Digestive Organs.*—1. Diarrhœa. 2. Dysentery. 3. Cholera. 4. Pyrosis.

III. *Urinary Organs.*—Diabetes.

IV. *Genital Organs.*—1. Gonorrhœa. 2. Leucorrhœa. 3. Adipose Tumour of the Ovary.

V. *Nostrils, Eyes, Ears, and Mouth.*—1. Catarrh. 2. Ptyalism.

VI. *Integuments.*—1. Acne. 2. Molluscum. 3. Sebaceous Tumours. 4. Polysarcia.

VII. *Organs of Voluntary Motion.*—Adipose Tumour of the Muscles.

DEPOSITIONS OF SERUM.

I. *Respiratory Organs.*—1. Œdema of the Glottis. 2. Œdema of the Lungs. 3. Hydrothorax.

II. *Circulating Organs.*—Dropsy of the Pericardium.

III. *Digestive Organs.*—Ascites.

IV. *Genital Organs.*—1. Hydrocele. 2. Dropsy of the Ovary.

V. *Nostrils, Eyes, Ears, and Mouth.*—1. Hydrophthalmia. 2. Aphtha.

VI. *Integuments.*—1. Erysipelas. 2. Pompholyx. 3. Vaccinia 4. Varicella. 5. Miliaria. 6. Herpes. 7. Rupia. 8. Eczema. 9. Anasarca.

VII. *Organs of Thought.*—1. Hydrorachitis. 2. Hydrocephalus.

VIII. *Organs of Voluntary Motion.* — 1. Rachitis. 2. Mollities Ossium. 3. Hydrarthrus. 4. Hygroma.

DEPOSITIONS OF BLOOD.

I. *Respiratory Organs.*—1. Hæmoptysis. 2. Pulmonary Apoplexy. 3. Hæmathorax.

II. *Digestive Organs.*—1. Hæmatemesis. 2. Hæmorrhois.

III. *Urinary Organs.*—1. Hæmaturia. 2. Cystirrhagia.

IV. *Genital Organs.*—1. Hæmatocele. 2. Menorrhagia.

V. *Nostrils, Eyes, Ears, and Mouth.*—1. Epistaxis. 2. Chemosis. 3. Scorbutus.

VI. *Integuments.*—Purpura.

VII. *Organs of Thought.*—1. Sanguineous Palsy. 2. Apoplexy.

DEPOSITIONS OF AIR.

I. *Respiratory Organs.*—1. Emphysema of the Lungs. 2. Pneumathorax.

II. *Circulating Organs.*—Air in the Pericardium.

III. *Digestive Organs.*—1. Intestinal Tympanites. 2. Peritoneal Tympanites.

IV. *Genital Organs.*—Physometra.

V. *Integuments.*—Pneumatosis.

DEPOSITIONS OF PUS.

I. *Respiratory Organs.*—1. Ulceration of the Larynx. 2. Abscess of the Lungs. 3. Phthisis. 4. Empyema.

II. *Circulating Organs.*—1. Abscess of the Heart. 2. Pus in the Pericardium. 3. Ulceration of the Arteries (False Aneurism). 4. Scrofula. 5. Tabes Mesenterica. 6. Abscess of the Spleen. 7. Abscess of the Thyroid Gland.

III. *Digestive Organs.*—1. Ulceration of the Gullet. 2. Ulceration of the Stomach. 3. Ulceration of the Intestines. 4. Abscess of the Liver. 5. Abscess of the Gall-Ducts. 6. Abscess of the Pancreas. 7. Pus in the Peritoneum.

IV. *Genital Organs.*—1. Abscess of the Testicle. 2. Ulceration of the Scrotum. 3. Ulceration of the Penis (Lues Venerea). 4. Ulceration of the Uterus. 5. Abscess of the Mamma.

V. *Nostrils, Eyes, Ears, and Mouth.*—1. Ozæna. 2. Purulent Ophthalmia. 3. Ulceration of the Cornea. 4. Ulceration of the Iris. 5. Hypopium. 6. Soft Cancer of the Eye. 7. Abscess of the Parotid Gland. 8. Ulceration of the Tongue and Lips. 9. Caries of the Teeth.

VI. *Integuments.*—1. Variola. 2. Impetigo. 3. Porrigo. 4. Ecthyma. 5. Scabies. 6. Sycosis. 7. Framboesia. 8. Ulcers in general.

VII. *Organs of Thought.*—1. Abscess of the Spinal Marrow. 2. Abscess of the Brain. 3. Pus in the Arachnoid Coat.

VIII. *Organs of Voluntary Motion.*—1. Caries of the Bones. 2. Abscess of the Bones (Lumbar Abscess, Morbus Coxarius, White Swelling, Osteosarcoma, &c.). 3. Arthropyosis.

GANGRENE.

All the Organs in the Body are liable to this Disease.

DISPLACEMENTS.

I. *Digestive Organs.*—1. Intus-susception. 2. Hernia. 3. Prolapse of the Anus.

II. *Urinary Organs.*—Cystocele.

III. *Genital Organs.*—1. Prolapse of the Vagina. 2. Prolapse of the Uterus. 3. Inversion of the Uterus. 4. Retroversion of the Uterus. 5. Extra-Uterine Conception. 6. Miscarriage. 7. Difficult Labour.

IV. *Nostrils, Eyes, Ears, and Mouth.*—1. Ectropium. 2. Entropium. 3. Prolapse of the Iris.

V. *Organs of Thought.*—Encephalocele.

VI. *Organs of Voluntary Motion.*—1. Fractures of the Bones. 2. Dislocations of the Joints.

SECOND DIVISION.

FUNCTIONAL DISEASES.

INCREASED ACTIONS.

I. *Respiratory Organs.*—Angina Pectoris.

II. *Digestive Organs.*—1. Spasm of the Gullet. 2. Gastrodynia. 3. Colic.

III. *Nostrils, Eyes, Ears, and Mouth.*—Nyctalopia.

IV. *Organs of Thought.*—Incubus.

V. *Organs of Voluntary Motion.*—1. Spasm of the Sphincter Ani. 2. Spasmodic Ischuria. 3. Priapism. 4. Trismus. 5. Tetanus. 6. Somnambulism.

PERTURBED ACTIONS.

I. *Respiratory Organs.*—Pertussis.

II. *Circulating Organs.*—Palpitation of the Heart.

III. *Digestive Organs.*—Hydrophobia.

IV. *Organs of Thought.*—1. Insanity. 2. Delirium Tremens.

V. *Organs of Voluntary Motion.*—I. Epilepsy. 2. Hysteria. 3. Chorea. 4. Shaking Palsy. 5. Barbiers.

DIMINISHED ACTIONS.

I. *Respiratory Organs.*—1. Asthma. 2. Asphyxia.

II. *Circulating Organs.*—Syncope.

III. *Digestive Organs.*—1. Palsy of the Gullet. 2. Dyspepsia. 3. Chlorosis.

IV. *Nostrils, Eyes, Ears, and Mouth.*—1. Hemeralopia. 2. Amaurosis.

V. *Organs of Thought.*—1. Idiotism. 2. Nervous Apoplexy. 3. Catalepsy.

VI. *Organs of Voluntary Motion.*—1. Palsy of the Tongue. 2. Palsy of the Sphincter Ani. 3. Palsy of the Sphincter Vesicæ. 4. Impotence.

No. V.

SYNOPSIS OF CUTANEOUS DISEASES.

ORDER I.

PAPULÆ (PIMPLES).

Genus I. Strophulus (Gum-Rash).
Species 1. Strophulus Intértinctus (Red-Gum).
2. Strophulus Albidus (White-Gum).
3. Strophulus Confertus (Tooth-Rash).
4. Strophulus Volaticus (Wildfire-Rash).
5. Strophulus Candidus (Pallid Gum-Rash).

Genus II. Lichen (Lichenous Rash).
Species 1. Lichen Simplex (Simple Lichen).
2. Lichen Pilaris (Hair-Lichen).
3. Lichen Circumscriptus (Clustered Lichen).
4. Lichen Agrius (Wild Lichen).
5. Lichen Lividus (Livid Lichen).
6. Lichen Tropicus (Prickly Heat).
7. Lichen Urticatus (Nettle-Lichen).

Genus III. Prurigo (Itching Rash).
Species 1. Prurigo Mitis (Mild Prurigo).
2. Prurigo Formicans (Creeping Prurigo).
3. Prurigo Senilis (Prurigo of Old Age).
4. Prurigo sine Papulis (Local Prurigo).
Variety 1. Prurigo Preputii (Itching of the Prepuce).
2. Prurigo Pubis (Itching of the Pubes).
3. Prurigo Urethralis (Itching of the Urethra).
4. Prurigo Podicis (Itching of the Anus.)
5. Prurigo Scroti (Itching of the Scrotum).
6. Prurigo Pudendi Muliebris (Itching of the Pudendum).

ORDER II.

SQUAMÆ (SCALY DISEASES).

Genus I. Lepra (Leprosy).
Species 1. Lepra Vulgaris (Common Leprosy).
2. Lepra Alphoides (White Leprosy).
3. Lepra Nigricans (Black Leprosy).

Genus II. Psoriasis (Dry-Scall).
Species 1. Psoriasis Guttata (Minute Dry-Scall).
2. Psoriasis Diffusa (Spreading Dry-Scall).
3. Psoriasis Gyrata (Tortuous Dry-Scall).
4. Psoriasis Inveterata (Obstinate Dry-Scall).
5. Psoriasis Localis (Local Dry-Scall).
Variety 1. Psoriasis Labialis (Scall of the Lips).
2. Psoriasis Lotorum (Washerwomen's Scall).
3. Psoriasis Palmaria (Scall of the Palm).

4. Psoriasis Ophthalmica (Scall of the Eye-Lids).
5. Psoriasis Pictoria (Baker's Scall).
6. Psoriasis Præputii (Scall of the Prepuce).
7. Psorirasis Scrotalis (Scall of the Scrotum).

Genus III. Pityriasis (Dandriff).
Species 1. Pityriasis Capitis (Dandriff of the Head).
2. Pityriasis Rubra (Red Dandriff).
3. Pityriasis Versicolor (Variegated Dandriff).
4. Pityriasis Nigra (Black Dandriff).

Genus IV. Icthyosis (Fish-Skin).
Species 1. Icthyosis Simplex (Simple Fish-Skin).
2. Icthyosis Cornea (Horny Fish-Skin).

ORDER III.

EXANTHEMATA (RASHES).

Genus I. Rubeola (Measles).
Species 1. Rubeola Vulgaris (Common Measles).
2. Rubeola sine Catarrho (Imperfect Measles).
3. Rubeola Nigra (Black Measles).

Genus II. Scarlatina (Scarlet-Fever).
Species 1. Scarlatina Simplex (Simple Scarlet-Fever).
2. Scarlatina Anginosa (Scarlet-Fever with Sore-Throat).
3. Scarlatina Maligna (Malignant Scarlet-Fever).

Genus III. Urticaria (Nettle-Rash).
Species 1. Urticaria Febrilis (Feverish Nettle-Rash).
2. Urticaria Evanida (Evanescent Nettle-Rash).
3. Urticaria Perstans (Stationary Nettle-Rash).
4. Urticaria Conferta (Confluent Nettle-Rash).
5. Urticaria Subcutanea (Subcutaneous Nettle-Rash).
6. Urticaria Tuberosa (Tumid Nettle-Rash).

Genus IV. Roseola (Rose-Rash).
Species 1. Roseola Æstiva (Summer Rose-Rash).
2. Roseola Autumnalis (Autumnal Rose-Rash).
3. Roseola Annulata (Ring-Formed Rose-Rash).
4. Roseola Infantilis (Infantile Rose-Rash).
5. Roseola Variolosa (Variolous Rose-Rash).
6. Roseola Vaccina (Vaccine Rose-Rash).
7. Roseola Miliaris (Miliary Rose-Rash).

Genus V. Purpura (Scurvy).
Species 1. Purpura Simplex (Petechial Scurvy).
2. Purpura Hæmorrhagica (Land-Scurvy).
3. Purpura Urticans (Nettle-Rash Scurvy).
4. Purpura Senilis (Scurvy of Old-Age).
5. Purpura Contagiosa (Contagious Scurvy).

Genus VI. Erythema (Inflammatory Blush).
Species 1. Erythema Fugax (Fugitive Inflammatory Blush).
2. Erythema Læve (Smooth Inflammatory Blush).
3. Erythema Marginatum (Marginated Inflammatory Blush).
4. Erythema Papulatum (Papulated Inflammatory Blush).
5. Erythema Tuberculatum (Tuberculated Inflammatory Blush).
6. Erythema Nodosum (Nodose Inflammatory Blush).
7. Erythema Intertrigo (Fretted-Skin).

Genus VII. Erysipelas (The Rose).
Species 1. Erysipelas Phlegmonodes (Phlegmonous Erysipelas).
2. Erysipelas Œdematodes (Œdematous Erysipelas).
3. Erysipelas Gangrœnosum (Gangrenous Erysipelas).
4. Erysipelas Erraticum (Wandering Erysipelas).

ORDER IV.

BULLÆ (BLEBS).

Genus I. Pemphigus (Vesicular Fever).
II. Pompholyx (Water-Bleb).
Species 1. Pompholyx Benignus (Mild Water-Bleb).
2. Pompholyx Diutinus (Lingering Water-Bleb).
3. Pompholyx Solitarius (Solitary Water-Bleb).

ORDER V.

PUSTULÆ (PUSTULES).

Variety I. Phlyzacium (Hot Push).
II. Psydracium (Cold Push).
III. Achor (Viscid Push).
IV. Favus (Honeycomb-Push).

Genus I. Impetigo (Humid or Running Scall).
Species 1. Impetigo Figurata (Figured Running-Scall).
2. Impetigo Sparsa (Scattered Running-Scall).
3. Impetigo Erysipelatodes (Erysipelatous Running-Scall).
4. Impetigo Scabida (Crusted Running-Scall).
5. Impetigo Rodens (Corroding Running-Scall).

Genus II. Porrigo (Moist Scall).
Species 1. Porrigo Larvalis (Milk-Scall).
2. Porrigo Furfurans (Branny Scall).
3. Porrigo Lupinosa (Lupine-like Scall).
4. Porrigo Scutulala (Scalled-Head).
5. Porrigo Decalvans (Bald-Scall).
6. Porrigo Favosa (Honeycomb-Scall).

Genus III. Ecthyma (Papulous Scall).
Species 1. Ecthyma Vulgare (Common Papulous Scall).
2. Ecthyma Infantile (Infantile Papulous Scall).
3. Ecthyma Luridum (Lurid Papulous Scall).
4. Ecthyma Cachecticum (Cachectic Papulous Scall).

Genus IV. Variola (Small-Pox).
Species 1. Variola Discreta (Distinct Small-Pox).
2. Variola Confluens (Confluent Small-Pox).
3. Variola Verrucosa (Warty Small-Pox).

Genus V. Scabies (The Itch).
Species 1. Scabies Papuliformis (Rank Itch).
2. Scabies Sympathetica (Watery Itch).
3. Scabies Purulenta (Pocky Itch).
4. Scabies Cachectica (Cachectic Itch).

ORDER VI.

VESICULÆ (VESICLES).

Genus I. Varicella (Chicken-Pox).
Species 1. Varicella Lentiformis (Lenticular Varicella).
2. Varicella Coniformis (Swine-Pox).
3. Varicella Globularis (Hives).

Genus II. Vaccinia (Cow-Pox).
III. Herpes (Tetter).
Species 1. Herpes Phlyctænodes (Miliary Herpes).
2. Herpes Zoster (Shingles).
3. Herpes Circinatus (Ring-Worm).
4. Herpes Labialis (Herpes of the Lips).
5. Herpes Præputialis (Herpes of the Prepuce).
6. Herpes Iris (Rainbow Ring-Worm).

Genus IV. Rupia (Foul Blane).
Species 1. Rupia Simplex (Simple Rupia).
2. Rupia Prominens (Conical Rupia).
3. Rupia Escharotica (Cachectic Rupia).

Genus V. Miliaria (Miliary Eruption).
VI. Eczema (Heat-Eruption).
Species 1. Eczema Solare (Sun-Heat).
2. Eczema Impetiginodes (Impetiginous Eczema).
3. Eczema Rubrum (Inflamed Eczema).

Genus VII. Aphtha (Thrush).
Species 1. Aphtha Lactantium (Infantile Thrush).
2. Aphtha Adultorum (Thrush of Adults).
3. Aphtha Anginosa (Aphtha of the Throat).

ORDER VII.

TUBERCULA (TUBERCLES).

Genus I. Phyma (Boil).
II. Verruca (Wart).
III. Molluscum (Wen).
IV. Vitiligo (Veal-Skin).
V. Acne (Hard Pimple).
Species 1. Acne Simplex (Simple Pimple).
2. Acne Punctata (Maggot-Pimple).
3. Acne Indurata (Stone-Pock).
4. Acne Rosacea (Rosy Drop).

Genus VI. Sycosis (Fig-Pock).
Species 1. Sycosis Menti (Sycosis of the Beard).
2. Sycosis Capillitii (Sycosis of the Scalp).

Genus VII. Lupus (Noli-Me-Tangere).
VIII. Elephantiasis (Black Leprosy).
IX. Bucnemia (Elephant-Leg).
X. Frambœsia (Yaws).

ORDER VIII.

MACULÆ (SPOTS).

Genus. I. Ephelis (Sun-Burn).
II. Nævus (Mother-Marks).
III. Spilus (Mole).
IV. Melanosis (Black-Cancer).
Species 1. Melanosis Diffusa (Diffused Malanosis).
2. Melanosis Concreta (Concrete Melanosis).
3. Melanosis Tumida (Swelling Melanosis).

Genus V. Kirranosis (Yellow Disease).
VI. Cyanosis (Blue Disease).
VII. Coriago (Hide-Bound).*

* In order to make this Synopsis complete, we have followed the example of Dr. Elliotson in adding a few genera, which are not to be found in Willan, and for which we are indebted to Dr. Milligan.

No. VI.

DR. FLETCHER'S TABLE OF POISONS.

PART I.

DISEASES, AND THE PRINCIPAL POISONS WHICH PRODUCE THEM.

FIRST DIVISION.

ORGANIC DISEASES.

I. *Bronchitis.*—Chlorine (from χλωρος, *green*).

II. *Inflammation of the Gullet.*—1. Virusses. 2. Meloe (Blistering-Fly). 3. Atropa (from Ατροπος, one of the Fates). 4. Euphorbia (from Euphorbus, Physician to King Juba). 5. Aconite (derived, by some, from ακονη, *a rock*;—because it grows in rocky places; and, by others, from ακων, *a dart*;—because darts were poisoned with it). 6. Ranunculus (the diminutive of "rana,"—*a frog*;—because it grows in marshy places). 7. Iodine (from ιωδες, *a violet-colour*). 8. *Hydriodate of Potash.* 9. *Oxalic Acid* (from οξυς, *sharp*). 10. Oxalate of Potassa. 11. Sulphuric Acid (from "sal,"—*a salt*; and πυρ, *fire*). 12. Nitric Acid. 13. Nitrate of Potassa. 14. Ammonia (from "Jupiter *Ammon*;"—near whose temple Sal Ammoniac was dug up). 15. Lime. 16. Potassa (so named from having been first made in *pots*). 17. Subcarbonate of Potassa (the *Carbonate* of the new London Pharmacopœia). 18. Black Oxide of Arsenic (probably from αρσην for αρρην, *powerful*). 19. Arsenious Acid (formerly called *White Oxide*). 20. Arsenite of Potassa. 21. Arsenic Acid. 22. Arseniate of Potassa. 23. Arseniuretted Hydrogen (from υδωρ, *water*; and γενναω, *to produce*). 24. Sulphurets of Arsenic. 25. Oxide of Mercury (perhaps Mercury itself in a state of minute division). 26. Muriate of Mercury (the *Bichloride* of the new London Pharmacopœia).

III. *Gastro-Enteritis.*—1. Virusses (Morbid Animal Poisons). 2. Venoms (Natural Animal Poisons). 3. Meloe. 4. Honey. 5. Atropa. 6. Datura (from an Indian word "datiro" of unknown meaning). 7. Strychnia (from στρωννυμι, *to overthrow*), in various Plants. 8. Conium (probably from κωναω, *to turn round*). 9. Cicuta (from "cœcuta,"—*blind*). 10. Colchium (from Colchis, a city where the plant was common). 11. Laurus (from "laus,"—*praise*;—because used for crowns). 12. Euphorbia. 13. Hydrocyanic Acid. 14. Aconitum. 15. Helleborus (from ελειν, *to kill*, βορα, *with food*). 16. Ranunculus. 17. Digitalis (from "digitus,"—*a finger*). 18. Cucumis (from "curvus,"—*bent*). 19. Momordica (from "mordeo,"—*to bite*). 20. Menispermum (from μηνη, *the moon*; and σπερμα, *seed*;—alluding to the crescentic form of the seeds). 21. Juniperus (from "juvenis,"—*young*; and "pario,"—*to bring forth*;—from having young and old berries at the same time). 22. Veratrum (probably from verè atrum,"—*truly black*;—alluding to the root). 23. Agaricus (probably from *Agaria*, an Eastern town). 24. Iodine. 25. Hydriodate of Potassa. 26. Chlorine. 27. Oxalic Acid. 28. Oxalate of Potassa. 29. Phosphorus (from φως, *light*; and φερω, *to carry*). 30. Sulphuric Acid. 31. Hydrosulphuric Acid (Sulphuretted Hydrogen). 32. Hydrosulphate of Potassa. 33. Nitric Acid. 34. Nitrate of Potassa. 35. Ammonia. 36. Lime. 37. Baryta (from βαρυς, *heavy*). 38. Carbonate of Baryta. 39. Mu-

riate of Baryta. 40. Potassa. 41. Subcarbonate of Potassa. 42. Sulphate of Zinc. 43. Muriate of Tin. 44. Black Oxide of Arsenic. 45. Arsenious Acid. 46. Arsenite of Potassa. 47. Arsenic Acid. 48. Arseniate of Potassa. 49. Arseniuretted Hydrogen. 50. Sulphurets of Arsenic. 51. Oxide of Antimony (probably from *αντι, against;* and *μονος, a monk;*—alluding to its early effects on the fraternity). 52. Tartrate of Ammonia (the *Potassio-Tartrate* of the new London Pharmacopœia). 53. Carbonate of Copper (from "cuprum," quasi "cyprium;"—having been brought from Cyprus). 54. Acetate of Copper. 55. Sulphate of Copper. 56. Oxide of Mercury. 57. Muriate of Mercury. 58. Nitrate of Silver. 59. Muriate of Gold.

IV. *Cystitis.*—1. Meloe. 2. Arsenic. 3. Mercury.

V. *Glossitis.*—1. Arum (probably from *αρα, an injury*). 2. Oxalic Acid. 3. Oxalate of Potassa. 4. Sulphuric Acid. 5. Nitric Acid. 6. Nitrate of Potassa. 7. Black Oxide of Arsenic. 8. Arsenious Acid. 9. Arsenite of Potassa. 10. Arsenic Acid. 11. Arseniate of Potassa. 12. Arseniuretted Hydrogen. 13. Sulphurets of Potassa. 14. Oxide of Mercury. 15. Muriate of Mercury.

VI. *Urticaria.*—1. Virusses. 2. Datura.

VII. *Phlegmasia Dolens.*—1. Virusses. 2. Venoms.

VIII. *Arachnitis.*—1. Virusses. 2. Venoms. 3. Meloe. 4. Honey. 5. Cicuta. 6. Alcohol (an Arabian word expressive of excellence). 7. Colchicum. 8. Laurus. 9. Helleborus. 10. Veratrum. 11. Agaricus. 12. Carbonic Oxide (from *"carbo,"—a coal).* 13. Carbonic Acid. 14. Sulphurous Acid. 15. Oxide of Antimony. 16. Tartrate of Antimony.

IX. *Jaundice.*—1. Virusses. 2. Venoms.

X. *Dysentery.*—1. Cucumis. 2. Helleborus. 3. Momordica. 4. Juniperus. 5. Arsenic.

XI. *Catarrh.*—Virusses.

XII. *Ptyalism.*—1. Digitalis. 2. Iodine. 3. Hydriodote of Potassa. 4. Nitric Acid. 5. Oxide of Mercury. 6. Muriate of Mercury. 7. Muriate of Gold.

XIII. *Hæmoptysis.*—Chlorine.

XIV. *Hæmatemesis.*—1. Meloe. 2. Oxalic Acid. 3. Oxalate of Potassa. 4. Sulphuric Acid. 5. Nitric Acid. 6. Nitrate of Potassa. 7. Oxide of Mercury. 8. Muriate of Mercury. 9. Muriate of Gold.

XV. *Hæmorrhois.*—1. Meloe. 2. Cucumis. 3. Momordica. 4. Juniperus.

XVI. *Hæmaturia.*—Meloe.

XVII. *Purpura.*—Venoms.

XVIII. *Tympanites.*—1. Agaricus. 2. Black Oxide of Arsenic. 3. Arsenious Acid. 4. Arsenite of Potassa. 5. Arsenic Acid. 6. Arseniate of Potassa. 7. Arseniuretted Hydrogen. 8. Sulphurets of Arsenic.

XIX. *Pneumatosis.*—Venoms.

SECOND DIVISION.

FUNCTIONAL DISEASES.

XX. *Colic.*—1. Oxide of Lead. 2. Carbonate of Lead. 3. Acetate of Lead.

XXI. *Priapism.*—1. Meloe. 2. Datura. 3. Black Oxide of Antimony 4. Arsenious Acid. 5. Arsenite of Potassa. 6. Arsenic Acid. 7. Arseniate of Potassa. 8. Arseniuretted Hydrogen. 9. Sulphurets of Arsenic.

XXII. *Tetanus.*—1. Venoms. 2. Secale (probably from "seco," *to cut*; alluding to the reaping of grain). 3. Datura. 4. Strychnia. 5. Brucea (named from Bruce, the traveller). 6. Cicuta. 7. Hydrocyanic Acid. 8. Aconitum. 9. Ranunculus. 10. Black Oxide of Arsenic. 11. ArseniousAcid. 12. Arsenite of Potassa. 13. Arsenic Acid. 14. Arseniate of Potassa. 15. Arseniuretted Hydrogen. 16. Sulphurets of Arsenic. 17. Oxide of Antimony. 18. Tartrate of Antimony. 19. Oxide of Lead. 20. Carbonate of Lead. 21. Acetate of Lead.

XXIII. *Insanity.*—1. Meloe. 2. Hyoscyamus (from *υς, a swine*; and *κυαμος, a bean*;—hogs being said to use it as a medicine). 3. Atropa. 4. Datura. 5. Conium. 6. Aconitum.

XXIV. *Delirium Tremens.*—1. Solium (Darnel). 2. Alcohol. 3. Hyoscyamus. 4. Atropa. 5. Datura. 6. Nicotiana (from Nicott, who introduced it into Europe). 7. Oxide of Mercury. 8. Muriate of Mercury.

XXV. *Epilepsy.*—1. Virusses. 2. Honey. 3. Secale. 4. Nicotiana. 5. Conium. 6. Cicuta. 7. Colchicum. 8. Laurus. 9. Hydrocyanic Acid. 10. Papaver (from "pappa,"—*pap*; with which nurses used to mix it, for quieting infants). 11. Helleborus. 12. Digitalis. 13. Arum. 14. Menispermum. 15. Veratrum. 16. Agaricus. 17. Carbonic Oxide. 18. Carbonic Acid. 19. Phosphorus. 20. Hydrosulphuric Acid. 21. Hydrosulphate of Potassa. 22. Nitrous Oxide. 23. Baryta. 24. Carbonate of Baryta. 25. Muriate of Baryta. 26. Black Oxide of Arsenic. 27. Arsenious Acid. 28. Arsenite of Potassa. 29. Arsenic Acid. 30. Arseniate of Potassa. 31. Arseniuretted Hydrogen. 32. Sulphurets of Arsenic. 33. Oxide of Antimony. 34. Tartrate of Antimony. 35. Oxide of Lead. 36. Carbonate of Lead. 37. Acetate of Lead. 38. Carbonate of Copper. 39. Acetate of Copper. 40. Sulphate of Copper. 41. Oxide of Mercury. 42. Muriate of Mercury. 43. Nitrate of Silver. 44. Muriate of Gold.

XXVI. *Syncope.*—1. Atropa. 2. Nicotiana. 3. Oxide of Mercury. 4. Muriate of Mercury.

XXVII. *Amaurosis.*—1. Hyoscyamus. 2. Atropa. 3. Datura. 4. Cicuta. 5. Carbonic Oxide. 6. Carbonic Acid.

XXVIII. *Idiotism.*—1. Datura. 2. Aconitum.

XXIX. *Nervous Apoplexy.*—1. Secale. 2. Alcohol. 3. Hyoscyamus. 4. Atropa. 5. Datura. 6. Nicotiana. 7. Strychnia. 8. Brucea. 9. Conium 10. Cicuta. 11. Laurus. 12. Hydrocyanic Acid. 13. Papaver. 14. Digitalis. 15. Agaricus. 16. Carbonic Oxide. 17. Carbonic Acid. 18. Carburetted Hydrogen. 19. Sulphurous Acid. 20. Hydrosulphuric Acid. 21. Hydrosulphate of Potassa. 22. Nitrous Oxide. 23. Baryta. 24. Carbonate of Baryta. 25. Muriate of Baryta. 26. Black Oxide of Arsenic. 27. Arsenious Acid. 28. Arsenite of Potassa. 29. Arsenic Acid. 30. Arseniate of Potassa. 31. Arseniuretted Hydrogen. 32. Sulphurets of Arsenic. 33. Oxide of Antimony. 34. Tartrate of Antimony. 35. Oxide of Lead. 36. Carbonate of Lead. 37. Acetate of Lead. 38. Carbonate of Copper. 39. Acetate of Copper. 40. Sulphate of Copper. 41. Oxide of Mercury. 42. Muriate of Mercury. 43. Nitrate of Silver.

XXX. *Local Palsy.*—1. Oxide of Lead. 2. Carbonate of Lead. 3. Acetate of Lead.

PART II.

POISONS, AND THE PRINCIPAL DISEASES WHICH THEY PRODUCE.

FIRST DIVISION.

ANIMAL POISONS.

I. *Capra* (the Goat).—The flesh, in some circumstances, becomes poisonous on ingestion; and the fluids, in others, by inoculation.

II. *Bos* (the Ox).—The same as Capra.

III. *Sus* (the Hog).—The same as Capra.

IV.—*Ornithorrynchus* (the Duck-Billed Animal).—1. Phlegmasia Dolens. 2. Tetanus.

V. *Phasianus* (the Pheasant-Genus, including the Domestic Fowl).—Gastro-Enteritis.

VI. *Rana* (the Toad).—It is provided with follicles which secrete a fluid of an irritating nature, when applied to the skin.

VII. *Crotalus* (the Rattle-Snake).—1. Gastro-Enteritis. 2. Phlegmasia Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumatosis.

VIII. *Boa* (a genus of Serpents).—1. Gastro-Enteritis. 2. Phlegmasia Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumotosis.

IX. *Coluber* (the Viper, &c.).—1. Gastro-Enteritis. 2. Phlegmasia Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumatosis.

X. *Balistes* (the File-Fish).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XI. *Tetrodon* (a genus of Fishes, found chiefly in Tropical Seas).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XII. *Muræna* (the Eel).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XIII. *Coryphæna* (the Parrot-Fish, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XIV. *Sparus* (a genus of Fishes, inhabiting the Mediterranean, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XV. *Clupæa* (the Herring, Pilchard, Sprat, Anchovy, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XVI. *Melöe* (the Blistering-Fly).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Arachnitis. 5. Hæmatemesis. 6. Hæmorrhois. 7. Hæmaturia. 8. Priapism. 9. Insanity.

XVII. *Apis* (the Bee;—the Honey prepared by it).—1. Gastro-Enteritis. 2. Arachnitis. 3. Epilepsy.

XVIII. *Aranea* (the Spider).—1. Gastro-Enteritis. 2. Phlegmasia Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumatosis.

XIX. *Scorpio* (the Scorpion).—1. Gastro-Enteritis. 2. Phlegmasia Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumatosis.

XX. *Cancer* (the Crab, Lobster, Crawfish, Prawn, Shrimp, &c.).—1. Gastro-Enteritis. 2. Phlegmasia-Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumatosis.

XXI. *Scolopendra* (the Earwig).—1. Gastro-Enteritis. 2. Phlegmasia Dolens. 3. Arachnitis. 4. Jaundice. 5. Purpura. 6. Pneumatosis.

XXII. *Ostrea* (the Oyster).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

XXIII. *Mytilus* (the Mussel).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Urticaria. 4. Arachnitis. 5. Jaundice. 6. Catarrh. 7. Epilepsy.

SECOND DIVISION.

VEGETABLE POISONS.

XXIV. *Secale* (Rye;—when spurred).—1. Gastro-Enteritis. 2. Tetanus. 3. Epilepsy. 4. Nervous Apoplexy.

XXV. *Solium* (Darnel).—1. Gastro-Enteritis. 2. Delirium Tremens.

XXVI. *Hordeum* (Barley;—the Alcohol distilled from it).—1. Arachnitis. 2. Delirium Tremens. 3. Nervous Apoplexy.

XXVII. *Hyoscyamus* (Henbane, &c.).—1. Insanity. 2. Delirium Tremens. 3. Amaurosis. 4. Nervous Apoplexy.

XXVIII. *Atropa* (Deadly Nightshade, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Delirium Tremens. 4. Syncope. 5. Amaurosis. 6. Nervous Apoplexy.

XXIX. *Datura* (Thorn-Apple, &c.).—1. Gastro-Enteritis. 2. Urticaria. 3. Priapism. 4. Tetanus. 5. Insanity. 6. Delirium Tremens. 7. Amaurosis. 8. Idiotism. 9. Nervous Apoplexy.

XXX. *Nicotiana* (Tobacco).—1. Gastro-Enteritis. 2. Delirium Tremens. 3. Epilepsy. 4. Syncope. 5. Nervous Apoplexy.

XXXI. *Strychnia* (in various Plants).—1. Gastro-Enteritis. 2. Tetanus. 3. Nervous Apoplexy.

XXXII. *Brucea* (obtained from False Angustura Bark).—1. Gastro-Enteritis. 2. Tetanus. 3. Nervous Apoplexy.

XXXIII. *Conium* (Hemlock).—1. Gastro-Enteritis. 2. Insanity. 3. Epilepsy. 4. Nervous Apoplexy.

XXXIV. *Cicuta* (Cow-Bane, &c.).—1. Gastro-Enteritis. 2. Arachnitis. 3. Tetanus. 4. Epilepsy. 5. Amaurosis. 6. Nervous Apoplexy.

XXXV. *Colchicum* (Meadow-Saffron).—1. Gastro-Enteritis. 2. Arachnitis. 3. Epilepsy.

XXXVI. *Laurus* (the Laurel, &c.).—1. Gastro-Enteritis. 2. Arachnitis. 3. Syncope. 4. Epilepsy. 5. Nervous Apoplexy.

XXXVII. *Euphorbia* (yielding Gum-Euphorbium, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis.

XXXVIII. *Amygdalus* (the Almond;—containing Hydrocyanic Acid).—1. Gastro-Enteritis. 2. Tetanus. 3. Epilepsy. 4. Nervous Apoplexy.

XXXIX. *Papaver* (the Poppy).—I. Epilepsy. 2. Nervous Apoplexy.

XL. *Aconitum* (Monk's-Wood, Wolf's-Bane, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Tetanus. 4. Insanity. 5. Idiotism.

XLI. *Helleborus* (Black Hellebore, Bear's-Foot, &c.)—1. Gastro-Enteritis. 2. Arachnitis. 3. Dysentery. 4. Epilepsy.

XLII. *Ranunculus* (Crow-Foot, Spear-Wort, Pilewort, &c.).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Tetanus.

XLIII. *Digitalis* (Fox-Glove).—1. Gastro-Enteritis. 2. Ptyalism. 3. Syncope. 4. Epilepsy.

XLIV. *Arum* (Wake-Robin, Dragon's-Wort, &c.).—1. Glossitis. 2. Epilepsy.

XLV. *Cucumis* (Bitter-Apple, &c.).—1. Gastro-Enteritis. 2. Dysentery. 3. Hæmorrhois.

XLVI. *Momordica* (Wild-Cucumber, &c.).—1. Gastro-Enteritis. 2. Dysentery. 3. Hæmorrhois.

XLVII. *Menispermum* (Cocculus Indicus, &c.).—1. Gastro-Enteritis. 2. Epilepsy.

XLVIII. *Juniperus* (Juniper).—1. Gastro-Enteritis. 2. Dysentery. 3. Hæmorrhois.

XLIX. *Veratrum* (White Hellebore, &c.).—1. Gastro-Enteritis. 2. Arachnitis. 3. Epilepsy.

L. *Agaricus* (the Mushroom).—1. Gastro-Enteritis. 2. Arachnitis. 3. Tympanites. 4. Epilepsy. 5. Nervous Apoplexy.

THIRD DIVISION.

MINERAL POISONS.

LI. *Iodine.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Ptyalism.

LII. *Hydriodate of Potash.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Ptyalism.

LIII. *Chlorine.*—1. Bronchitis. 2. Gastro-Enteritis. 3. Hæmoptysis.

LIV. *Carbonic Oxide.*—1. Arachnitis. 2. Epilepsy. 3. Amaurosis. 4. Nervous Apoplexy.

LV. *Carbonic Acid* (Fixed Air).—1. Arachnitis. 2. Epilepsy. 3. Amaurosis. 4. Nervous Apoplexy.

LVI. *Oxalic Acid.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Glossitis. 4. Hæmatemesis.

LVII. *Oxalate of Potassa* (Salt of Sorrel).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Glossitis. 4. Hæmatemesis.

LVIII. *Carburetted Hydrogen.*—Nervous Apoplexy.

LIX. *Phosphorus.*—1. Gastro-Enteritis. 2. Epilepsy.

LX. *Sulphurous Acid.*—1. Arachnitis. 2. Nervous Apoplexy.

LXI. *Sulphuric Acid* (Oil of Vitriol).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Glossitis. 4. Hæmatemesis.

LXII. *Hydrosulphuric Acid* (Sulphuretted Hydrogen).—1. Gastro-Enteritis. 2. Epilepsy. 3. Nervous Apoplexy.

LXIII. *Hydrosulphate of Potassa.*—1. Gastro-Enteritis. 2. Epilepsy. 3. Nervous Apoplexy.

LXIV. *Nitrous Oxide* (Laughing-Gas).—1. Epilepsy. 2. Nervous Apoplexy.

LXV. *Nitric Acid* (Aqua Fortis).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Glossitis. 4. Hæmatemesis.

LXVI. *Nitrate of Potash* (Nitre, or Saltpetre).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Glossitis. 4. Hæmatemesis.

LXVII. *Ammonia* (Spirit of Hartshorn).—1. Inflammation of the Gullet. 2. Gastro-Enteritis.

LXVIII. *Lime.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis.

LXIX. *Baryta.*—1. Gastro-Enteritis. 2. Epilepsy. 3. Nervous Apolexy.

LXX. *Carbonate of Baryta* (Heavy Spar).—1. Gastro-Enteritis. 2. Epilepsy. 3. Nervous Apoplexy.

LXXI. *Muriate of Baryta.*—1. Gastro-Enteritis. 2. Epilepsy. 3. Nervous Apoplexy.

LXXII. *Potassa* (Kali).—1. Inflammation of the Gullet. 2. Gastro-Enteritis.

LXXIII. *Subcarbonate of Potassa* (Salt of Tartar).—1. Inflammation of the Gullet. 2. Gastro-Enteritis.

LXXIV. *Sulphate of Zinc* (White Vitriol).—Gastro-Enteritis.

LXXV. *Muriate of Tin.*—Gastro-Enteritis.

LXXVI. *Black Oxide of Arsenic.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXVII. *Arsenious Acid* (White Arsenic).—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXVIII. *Arsenite of Potassa.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXIX. *Arsenic Acid.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXX. *Arseniate of Potassa.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXXI. *Arseniuretted Hydrogen.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXXII. *Sulphurets of Arsenic.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Dysentery. 6. Hæmatemesis. 7. Tympanites. 8. Priapism. 9. Tetanus. 10. Epilepsy. 11. Nervous Apoplexy.

LXXXIII. *Oxide of Antimony.*—1. Gastro-Enteritis. 2. Arachnitis. 3. Tetanus. 4. Epilepsy. 5. Nervous Apoplexy.

LXXXIV. *Tartrate of Antimony* (Tartar-Emetic).—1. Gastro-Enteritis. 2. Arachnitis. 3. Tetanus. 4. Epilepsy. 5. Nervous Apoplexy.

LXXXV. *Oxide of Lead.*—1. Colic. 2. Tetanus. 3. Epilepsy. 4. Local Palsy.

LXXXVI. *Carbonate of Lead* (White Lead).—1. Colic. 2. Tetanus. 3. Epilepsy. 4. Local Palsy.

LXXXVII. *Acetate of Lead* (Sugar of Lead).—1. Colic. 2. Tetanus. 3. Epilepsy. 4. Local Palsy.

LXXXVIII. *Carbonate of Copper.*—1. Gastro-Enteritis. 2. Epilepsy.

LXXXIX. *Acetate of Copper* (Verdigris).—1. Gastro-Enteritis. 2. Epilepsy.

XC. *Sulphate of Copper* (Blue Vitriol).—1. Gastro-Enteritis. 2. Epilepsy.

XCI. *Oxide of Mercury.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Ptyalism. 6. Hæmatemesis. 7. Delirium Tremens. 8. Epilepsy. 9. Syncope.

XCII. *Muriate of Mercury.*—1. Inflammation of the Gullet. 2. Gastro-Enteritis. 3. Cystitis. 4. Glossitis. 5. Ptyalism. 6. Hæmatemesis. 7. Delirium Tremens. 8. Epilepsy. 9. Syncope.

XCIII. *Nitrate of Silver* (Lunar Caustic).—1. Gastro-Enteritis. 2. Epilepsy.

XCIV. *Muriate of Gold.*—1. Gastro-Enteritis. 2. Ptyalism. 3. Epilepsy.*

No. VII.

DISEASES OF THE PERICARDIUM.

Pericarditis would never be selected to show the advantages of auricular examination. In the *acute* form, at least, it is only of *negative* utility. But the consideration of this disease will prove the injustice of those who assert, that auscultators both regard auscultation as a universal light, and neglect the investigation of general symptoms. On examination by the ear, the whole heart is found acting more forcibly, and with a clearer sound than in health. But this is all. Auscultation appears to me, however, to be of *negative* use. We do not discover the loud murmur, or the sonorous or sibilous rattle of bronchitis, the respiratory rattle or obscure respiratory murmur of pneumonia, or the ægophony of pleuritic effusion, unless these diseases are combined with pericarditis. Neither have we the partially *excessive,* or *defective* impulse or sound, or *preternatural* sounds, of organic diseases of the *heart.* In all *uncombined* cases, therefore, light is thrown on the disease. I remember having once found auscultation of great use in the diagnosis of a disease which might have been considered to be clearly pericarditis. The patient was a poor Irishman; and the Irish are by no means happy in their attempts at a lucid history and description of their diseases. He complained of pain in the region of the heart, increased on pressure; and of palpitation and dyspnœa; and declared he had been ill but a few days. The case appeared to be pericarditis. The pulse was full, and the constitution good. There appeared to be every reason to bleed him freely, and to put the whole antiphlogistic plan in force. But on listening to the heart's action, the left ventricle was found to give a violent, dead, noiseless blow against the chest; and the case was evidently one of hypertrophy of the left ventricle. I insisted to the man that he had long been ill; and it was ascertained from his own mouth, and from his wife, that he had suffered palpitation and dyspnœa for a great length of time; and that the error in the history which he had given, arose from his having been compelled to leave off work only a few days before. He died in a fortnight; and great hypertrophy of the left ventricle was discovered. M. Collier says, that the action of the heart is accompanied by a sound resembling that of new leather. Laennec does not mention it; but remarks the occasional occurrence of a sort of *click,* which some people mistake for a *bruit de soufflet.*

The anatomical characters are little different from those of inflammation of

* We have introduced some modifications into this Table, with the view of increasing its perspicuity.

other serous membranes. Either there is a partial redness (patches),—sometimes as if the membrane were injected, at others as if dyed red; or there are groups of red points. The redness is seldom deep; and, even in the most violent cases, is often very faint. The membrane was never, in a single instance, observed by Laennec to be *thickened*, though Dr. Baillie declares this to be frequently the case; but upon it lies a quantity of fibrin, thicker and more consistent than in pleurisy; and differing from the fibrin of pleurisy, also, in being generally irregular on its surface;—sometimes with minute pores; sometimes with depressions so large, as to give it the appearance of the second stomach of the calf; sometimes knobbed,—like butter (to use Leannec's expression) spread upon two slabs, first approximated, and then suddenly separated from each other. Dr. Baillie says that the fibrin never adheres firmly; Laennec, that it adheres more firmly than in pleurisy. Although the redness is partial, this exudation is most frequently general; and is often very abundant when the redness is slight. It is of the ordinary pale colour. The *serum* effused is in far less proportion to the *fibrin*, than in pleurisy;—seldom amounting to a pint, though it has amounted to *four* pints; and sometimes scarcely any is found. It is of the common whitish lemon-colour; rarely limpid; sometimes very turbid,—containing larger or smaller flocculi of lymph; or absolutely curdled, as if only one kind of effusion had taken place. Sometimes it is bloody; sometimes puriform. Dr. Baillie once saw a *quart* of pus in a pericardium violently inflamed, but free from ulceration. If the inflammation have been very severe, lymph is often found (in more or less quantity) on even the *external* surface of the pericardium;—uniting it by bands to the pleura.

The *substance* of the heart, after pericarditis, may be unchanged; or it may be redder or paler than usual, yellowish or brown, hardened or softened. After the *chronic* disease, it has been found hypertrophied. It is usually when the organ is softened, that we observe the effused serum to be bloody. In the disease which consists in the heart being softened, I have almost always found bloody serum in the pericardium. Not only the *substance* of the heart, but its lining membrane, especially at the valves, is also frequently affected;—sometimes in the *acute* form of pericarditis; but generally in the *chronic*, if very long continued. A case of pericarditis,—the pericardium containing several ounces of turbid fluid, with flakes of lymph, and being covered, in various situations, with a reticulated layer of lymph,—is described by Mr. Stanley, in the seventh volume of the "Medico-Chirurgical Transactions." The substance of the heart was almost black with congealed blood; very soft, and studded with little collections of dark pus. In the majority of cases, disease both of the *substance* of the heart and of the *valves*, arises from, or is coetaneous with, or springs up during, inflammation of the pericardium.

As time elapses after the acute attack of pericarditis, the effused liquid is absorbed; the fibrin grows to the cardiac and parietal portions of the pericardium; and adhesions, more or less partial or general, of cellular or serous membrane are produced. Like those of other serous sacs, these are usually thinner and stronger, the older their date. The adhesions are sometimes very thick and fibrous,—fleshy, as it were; and sometimes even cartilaginous and bony. I have frequently seen the whole cardiac and parietal pericardium coherent; so that no pericardial cavity existed;—the serum being entirely absorbed, and the fibrin nearly so; and such cases have occasionally been mistaken for instances of the absence of the pericardium. Sometimes the fibrin effused becomes cellular; and, contracting no adhesions, lies pale (like lace) on the surface of the heart. Sometimes merely an opaque white patch remains, which can be peeled off; and sometimes, instead of *smooth* patches, we have opaque white granulations. The reason is not obvious why the fibrin within the pericardium sometimes adheres, and sometimes does not. The degree of serous effusion, and the consequent proportionate separation of parts, affords no explanation; because, first, we often see one portion of lymph adherent, while another by its side is not; and, secondly, there is often a total absence of adhesion, without sufficient serous effusion to account for it. The adhesions within the pericardium left after pericarditis, are almost the only instances that occur in this membrane. I have never seen adhesions, except with redness of the membrane, or the presence of turbid fluid, or after the existence of decided

symptoms of pericarditis. In the *pleura* they are continually found, without the least previous symptom of inflammation, and without redness or turbid effusion.

Pericarditis is occasioned by all the causes of inflammation of serous membranes in general. But the most frequent is either exposure to cold,—especially after a warm temperature, and if rheumatism is also adduced; or sympathy with the fibrous membranes of joints attacked by rheumatism. It will occur either simultaneously with the rheumatism, or not till the rheumatism has existed for a longer or shorter period, has even gradually declined, or altogether ceased for some time. It sometimes occurs (though the metastasis is comparatively rare) when the rheumatism suddenly disappears.

Pericarditis is usually not very violent; but is disposed to assume the chronic form; and frequently steals on, as a chronic disease, from the abuse of fermented liquors. In chronic pericarditis, the valves, and finally the substance of the heart, become diseased. From these circumstances, the connection between rheumatism and affection of the heart was first noticed in the stage of organic disease; and rheumatism was said to produce, not inflammation of the pericardium, but disease of the heart. Occasionally the pericardium may not be affected, and occasionally but in a secondary manner; yet of this I am certain, that nearly all the cases of affection of the heart after rheumatism, are originally pericarditis; and that when the *inner* membrane of the heart is thus affected from the first, so also is the pericardium. Among the cases of organic disease of the heart connected with rheumatism, published by Dr. Wells, nearly twenty years ago, in the "Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge," those which proved fatal displayed a complete abolition of the pericardial cavity, or strong or abundant partial adhesions; and those which did not prove fatal, were marked by decided symptoms of pericarditis. In nearly all those mentioned by Sir David Dundas, in the first volume of the "Medico-Chirurgical Transactions," of London, the pericardium was adherent. Every dissection that I have made after death, during the early period of the disease, has proved the case to be violent pericarditis; the history of every chronic case that I have witnessed, could be clearly traced back to pericarditis; and even the least affection of the heart that I have seen take place during rheumatism, has been marked pericarditis. The pleura, particularly of the left side, is occasionally inflamed at the same time; and the subsequent chronic organic disease of the heart, is of every possible variety. Dr. Pitcairn, of St. Bartholomew's Hospital, was the first who noticed, about the year 1788, the connexion of rheumatism with disease of the heart; and Dr. Baillie, in 1797, was the first who published on the subject. They considered the disease to be a morbid growth of the heart. Sir David Dundas, who published on the subject many years afterwards (in 1808), without reference to the observations of these physicians, mentions the disease as dilatation of the heart, and chiefly of the left ventricle; with paleness and softness of its substance, and adherence of the pericardium. He asserts his belief that no account of the matter was to be found in any medical writer;—as though, remarks Dr. Wells, it were easy to suppose him ignorant of what had been published, twelve years before, in so popular a work as Dr. Baillie's "Morbid Anatomy." From the imperfection of Morbid Anatomy in this country, twenty years ago, Dundas's description is very loose. However, in one of Mr. Wells's cases, which proved fatal early, and was opened by Mr. Brodie, nothing but pericarditis was discoverable; and Dr. Wells, who was no less distinguished for his sagacity than for his independence, evidently regarded the rheumatic affection of the heart as inflammatory, by advising copious bleeding at the outset. The disease would appear sometimes to remain, very long, mere pericarditis; or, at least, merely an inflammatory affection; for it is sometimes cured after a lapse of time; and sometimes continues for many years, with no signs of organic disease; and proving troublesome only when cold is accidentally caught, and a fresh attack of rheumatism in the joints is induced.

Most instances of rheumatic pericarditis commence in persons from about the age of puberty to near thirty. We occasionally see it in younger persons; rarely, for the first time, in older. I once saw it in an infant. With neither of Dr. Baillie's remarks,—that pericarditis is not very common, and that it chiefly attacks persons who have been some time adults,—does my experience at all agree. The

French do not appear aware of the connexion of pericarditis with rheumatism, except as an ordinary instance of internal inflammation, upon the sudden retrocession of an external disease.

Acute pericarditis is, of course, attended by more or less pyrexia. There is a pain in the region of the heart, sometimes severe and lancinating; generally darting through to the left scapula, upwards to the left scapula and shoulder, and down the arm, a certain way;—for (what is remarkable) it rarely extends quite so far as the elbow. I lately had a case, in which the pain extended down the forearm; but it did not quite reach the wrist. The pain is increased by pressing forcibly upon, or between the ribs and cartilages over the heart; and by pressing with the points of the fingers upwards against the diaphragm, under the cartilages of the left false ribs;—frequently even by pressing the epigastrium, and left hypochondrium, in the usual manner. The pain is often increased on inspiration, and by lying on the left side. I think patients are usually easiest on the back. The respiration is rapid; but less so than in affections of the lungs. There is sometimes a cough, which is dry; and nearly always palpitation, which is frequently violent,—at least upon exertion. Sometimes, though more rarely, there is a disposition to syncope. The pulse varies exceedingly. It is necessarily quick; and often, but not always, small, in proportion to the heart's action; and only sometimes intermittent and irregular. Neither is it always hard, or even full. The countenance is described as anxious, and the features are contracted; but this, I imagine, happens only when the pain is acute; and is equally the case in pleuritis.

The diagnosis of pericarditis is thought, by many, to be extremely difficult. Laennec declares, that he has frequently suspected it where it was not found, and found it where he had not suspected it. By close inquiry into the existence of all the marks I have mentioned, the diagnosis has never proved difficult to me: I would particularly lay stress upon the extension of the pain from the region of the heart to the scapula, and the shoulder, and a certain way down the arm;—symptoms which patients will not always mention, unless questioned respecting them; together with its increase on strong pressure upon and between the ribs and cartilages over the heart, and upwards under the cartilages of the left false ribs. These two points I do not remember to have seen mentioned anywhere; and the others are not dwelt upon in some of the best books. In Andral's "Clinique Medicale," pain at the epigastrium on pressure, is said to have occurred in some cases; but this point is not spoken of as if inquired into. In one case only is the extension of pain to the arm mentioned; and its extension even to the shoulder, does not seem to have formed an object of inquiry. I am certain that, on a scrutinizing examination, the existence of pericarditis will very rarely be mistaken; and from this conviction, and the frequency of its occurrence during acute rheumatism, I make it as invariable a rule to examine the cardiac region by the touch and hearing, in every case of acute rheumatism, as the usual seats of hernia are examined by us all, in cases of colic and intestinal inflammation. Were this rule universally observed, practitioners would not occasionally be surprised by the death of patients, in what had been considered to be merely acute rheumatism.

I think I have observed free *local* bleeding to be more serviceable than *general*; and that mercury is of equal efficacy in acute pericarditis, as in other acute inflammations;—over which, wherever they may be situated, a very extensive experience of many years has fully satisfied me,—conformably with the observations of many able physicians,—that mercury, possesses far more power than any other medicine. Bleeding, and other ordinary measures, cure diseases of severe inflammation every day; and, in cases of little danger, they may be relied on. But they frequently fail in cases of intensity; and I know that if, in addition to suitable bleeding, mercurial ptyalism is quickly induced, active inflammation will very rarely destroy; and that, not only is fatality almost always prevented, but far less bleeding is required. This has been my practice from the commencement of my professional life; and where I employed mercury with freedom, I have never met with a necessity for those frightful bleedings of quart after quart, recorded from time to time in our publications. I have given the Antimonium Tartarizatum (in quantities of a scruple or half a drachm, every twenty-four hours), hydrocyanic

acid, and other medicines recommended by the Italians; but have found them all greatly inferior to mercury. Among the best, unquestionably, is colchicum; and its power over actual gout and rheumatism of the extremities, is universally acknowledged to be very great. After the violence of acute pericarditis is subdued, it appears of use in restraining the morbid irritability, which sometimes still continues in the heart; and several chronic cases, of which I had despaired, have gradually recovered under perseverence in its use for many months.

The *cellular* side of the pericardium, like that of other serous membranes, is sometimes, though very rarely, the seat of hydatids, cysts, scrofulous and other tubercles, and ossification. The diagnosis must be impossible; and indeed, in some cases, no symptoms have been observable. The pericardium is sometimes the seat of sudden and fatal hæmorrhage, without previous indisposition. Like the arachnoid, it is sometimes perfectly dry. Sometimes it contains air either alone or with a preternatural quantity of fluid;—in the latter of which cases, fluctuation or undulation has occurred. Sometimes the pericardium is absent. At least five unquestionable cases of this singularity are on record.

The quantity of fluid at a certain period of *acute* pericarditis, and in *chronic* pericarditis, is occasionally (though not often) so considerable, that hydrops pericardii exists. The quantity should certainly amount to half a pint, for us to expect inconvenience from it. Unless it be considerable, it is indicated with no more certainty by auscultation and percussion, than by the ordinary symptoms. But if the quantity be large, there is a dull sound, to a great extent, on striking the cardiac region. The heart's action may be perceived very faintly, and perhaps in a diffused manner; so that the epigastrium pulsates or vibrates; and may appear fuller than in health. Patients have experienced a sense of weight in the cardiac region; and even fluctuation has been detected. In cases of copious effusion of blood, pus, or serum, into the pericardium, these symptoms have suddenly appeared; and good examples of the occurrence of some of them may be found in Andral. A fluid occasionally collects in the pericardium (as it does in the pleura, the peritoneum, the arachnoid, and the tunica vaginalis,) by a slow process,—not amounting to inflammation. The membrane is not red but perhaps opaque, and even thickened, and of a satin-whiteness. This condition is, I believe,—where no redness of inflammation is visible,—the common cause of ascites, chronic hydrocephalus, hydrocele, and idiopathic hydrothorax; and though, like the state which gives birth to one kind of adhesions in serous membranes, it may be the result of a change *allied* to inflammation, it hardly merits the title of "inflammation;"—judging from the absence of inflammatory symptoms, the absence of redness in the membrane, the pellucidity of the fluid, and the inutility of anti-inflammatory measures.—*Recent Improvements in the Art of Distinguishing the Various Diseases of the Heart. By John Elliotson, M.D. Pages* 8 *to* 11.

No. VIII.

HEALTHY SOUNDS OF THE HEART.

Besides the impulse which is given by the heart to the left side of the chest, its action affords a distinct sound in health on applying the ear, either immediately to the parietes, or with the intervention of a solid medium. The sound is double; and, indeed, to many persons perceptibly so to *themselves*, on lying upon the left side. The first sound is heard at the moment the pulse is felt in the wrist, or after the smallest possible interval; the second is heard immediately afterwards. The first, according to Laennec, arises from the *ventricular* action; the second from the *auricular*. The first is rather dull and long; the second short and clear;—a kind of smack. After the second, a short pause ensues, before the dull sound of the ventricles, the stroke of the heart's apex, and the pulse at the wrist. The whole period is estimated by Laennec, at about one-half for the *ventricular* contraction, one quarter for the *auricular*, and one quarter for the pause. The

sound of the *auricles* is heard best at the *upper* part of the cardiac region; the sound of the *ventricles*, at the *lower*. The sounds of the *left* auricle and ventricle, are heard best at the cartilages of the fifth, sixth, and seventh left ribs; those of the *right* auricle and ventricle, at the sternum.

When the passage of the blood from either ventricle is materially impeded, the sound which is synchronous with the pulse, and loudest at the lower part of the cardiac region, is changed to a blowing, whizzing, shrill, or cooing character. If the impediment be in the left ventricle,—at the mouth of the aorta, it is loudest at the cartilages of the ribs to the left of the sternum; if in the right ventricle,—at the mouth of the pulmonary artery, it is loudest at the sternum, and to the right. The sound is often so loud, that it prevents the natural sound of the auricles from being distinctly perceptible, till the ear or the stethoscope is removed from the region of the *ventricles*, to a higher place,—the region of the *auricles*.

When the impediment is at either of the auriculo-ventricular openings, the morbid sound is heard at the moment of the auricular contraction;—not synchronously with the radial pulse, and the stroke of the heart's apex; and is generally loudest at the superior part of the cardiac region. It is loudest at the cartilages of the left ribs, when the *left* auriculo-ventricular opening is narrowed;—loudest at the sternum and to the right, when the narrowing is at the *right* auriculo-ventricular opening. When an auriculo-ventricular opening is narrowed, and the morbid sound is heard at the auricular contraction, the action of the auricle is not instantaneous, as in health, but rather slower; so that we can fancy we hear the cavity gradually empty itself. I do not think this slowness so observable in cases of narrowing of the mouth of the pulmonary artery or the aorta.

Laennec's correctness in ascribing the *first* of the two sounds of the heart's action in health to the *ventricle*, and the *second* to the *auricle*, has been called in question;—some asserting that the first sound is the result of the *auricular* contraction, and the second of the *ventricular*; some that they occur at the moment of the *dilatation*, not at the moment of the *contraction* of the cavities; and some that Laennec was right in regard to the *ventricular* sound, but that the second sound cannot arise from the contraction of the auricle; since Harvey, Haller, and Senac, all declare that the auricle may be seen to contract immediately *before* the ventricular action; and they consider, therefore, that the sound which follows the ventricular, is produced by some unknown cause; and that the *auricular* contraction is *without* sound;—two very singular, and very considerable suppositions. The alteration of the sound when the respective openings are narrowed, proves (I think) that Laennec is right; for if the opening from a *ventricle* be narrowed, the healthy sound ascribed by Laennec to the ventricles is altered; and if the opening from an *auricle* be narrowed, the healthy sound ascribed by Laennec to the auricle is altered. An argument in favour of the priority of the auricular contraction, has been deduced from the fact that, in some cases, the veins of the neck regularly swell, immediately before the pulse is felt. But the obstruction in the auricles, causing this swelling, does not (I apprehend) occur during the *contraction* of the auricles; for, at that moment, there is a free space in the ventricles to receive the auricular blood; and it is only a part of the auricle that has the power of contraction. The obstruction which produces the swelling, must take place as the ventricle becomes filled, and the blood consequently, accumulates; and therefore the swelling of the veins must be expected when the ventricles will receive no more; namely, immediately before they contract, or while they are contracting. There is no wonder, therefore, that the arteries, according to this account, beat first; then a second sound of the heart is heard,—I presume the auricular action; and then a short interval occurs before the veins pulsate,—before the blood accumulates in the auricles, previously to their contraction. The jugular veins are said, by some, always to be dilated quite synchronously with the pulse of the arteries.

Since the delivery of these lectures [the Lumleyan, in 1829], Laennec's accuracy has been called in question by others; and the stroke of the heart's apex, and the *first* sound of the heart, have been declared to happen before the pulse; and to be produced by the *dilatation* and *repletion* of the ventricle; and the *second* sound has been said to occur at the moment of the *contraction* of the ventricles, and to arise from the flapping of the parietes of the emptied ventricles together.

I would reply, in the first place, as before, that when an obstruction exists at the mouth of the *aorta* or *pulmonary artery*, a morbid sound occurs at the moment when Laennec supposes the *ventricles* to contract; and when an obstruction occurs at either *auriculo-ventricular* opening, a morbid sound occurs at the moment he supposes the *auricles* to contract. This could not happen had he mistaken the periods of the ventricular and auricular contractions.

Secondly, when the pulse at the wrist follows the stroke of the heart, it does so after only a very minute interval;—such as may be explained by the distance of the radial artery from the heart; and actually occurs decidedly *before* the auricular sound;—that sound which is now declared to be the *ventricular*. Moreover, when the pulse of the wrist is observed to follow the stroke of the heart, the pulse at the innominata (so much nearer the heart) may be found to precede that at the wrist, and to occur all but simultaneously with the stroke of the heart; so that the relative distance of the parts explains the whole difference; and the pulsation of the arteries, in all cases, clearly arises from the stroke of the heart. If an artery still nearer the heart than the innominata be observed, *no* interval between its pulse and the stroke of the heart is perceptible. In four cases of aneurism of the ascending aorta, producing a strongly pulsating tumour to the right of the sternum, this and the heart, when the fore-fingers were placed upon both, were felt, and by all seen, to pulsate quite synchronously. When the obstruction is at the mouth of the *aorta* or *pulmonary artery*, I have always noticed the preternatural sound to be *synchronous* with the pulse;—when at an *auriculo-ventricular* opening, in the *intervals* of the pulse,—*after* or *before* the pulse. Sometimes in the latter case, it is so prolonged, as to last till the pulse is again felt; so that there is no interval; but merely an equal alternation of the ventricular, and the preternatural auricular sound: or even an interval occurs after the ventricular stroke;—probably from the auricle not being disposed for contraction at the usual time; on account of its contraction having been so lengthened by the difficult escape of its blood, that a longer repose is required, than just during the ventricular contraction. Hear the *auricular* sound occurs first; then the *ventricular;* and then the *interval.*

Thirdly,—the sounds considered by Laennec to be auricular and ventricular, are heard loudest (both in health and when morbid) at the seat of the auricles and ventricles respectively.—*Recent Improvements, &c. Pages* 15 *and* 16.

No. IX.

ANEURISM OF THE HEART.

Dilatation of the heart is sometimes partial. Dr. Bertin says, that he has frequently found a cavity dilated in one point; while in every other it preserved its natural state, or was even narrowed or hypertrophied. "The right ventricle, for example," he adds, "is often considerably dilated near the pulmonary artery; while the rest of the chamber preserves its ordinary dimensions." I have not yet met with this. But an example is now before me, of partial aneurism of the heart;—of aneurism such as occurs in *arteries*, and therefore necessarily partial. Corvisart found, upon the superior and lateral part of the heart of a young negro who had died in a state of asphyxia, a tumour nearly as large as the heart itself. Its interior contained several dense layers of coagula,—perfectly similar to those which fill the cavities of *arterial* aneurisms; and communicated with the cavity of the ventricle by a narrow opening, the margin of which was smooth and polished. The German anatomist, Walter the elder, had previously described a case of this kind. Drs. Baillie, Zannini, James Johnson, Cruveilhier, Rostan, and Breschet, each mention one. Dr. Beard mentions two; and Talma's heart proved to be in this state. Two aneurisms are mentioned by Dr. Reynaud as occurring in the same heart. There are two specimens in the Museum of St. Thomas's Hospital,

In one, the aneurism is nearly as large as the heart; and in the other, the aneurism is pyramidal, and projects into the left auricle. One lately occurred at St. George's Hospital; and, like one of those at St. Thomas's, projected into the left auricle. Two are mentioned by Mr. Adams; one of which was, like the other at St. Thomas's, nearly as large as the heart itself. In all these cases, the aneurism existed in the left ventricle: in some at the *apex;* in others (almost equally numerous) at the *base,*—as in the case before me, in which there are *two* aneurisms; in others, *between* the base and the apex; in Corvisart's at the *side;* and, in others, at the *front.*

Aneurism is a disease of *arteries,*—never of *veins;* and it is remarkable that the disease was never detected but in the left,—the *arterial* side of the heart; and, indeed, never but in the left *ventricle,* with which the general arterial system is directly continuous. This circumstance accords both with the general observation of the greater frequency of all diseases on the *left* than on the *right* side of the heart, and in the *ventricle* than in the *auricle;* and with the other part of this individual disease (aneurism) being an *arterial* disease; or rather, I should say, a disease of parts containing decarbonized blood; for the pulmonary artery, which contains *black* blood, has not (I believe) yet been seen to be the seat of aneurism. far as appears known, all the instances, except one, have occurred in adult *males;* and *arterial* aneurism occurs eight times more frequently in *males* than in *females.*

This cardiac affection is the first of those in which auscultation renders no assistance. The *general* symptoms which may occur, may well therefore be supposed, by those who know the value of auscultation, to leave the nature of the disease in doubt. Dr. Baillie says the symptoms "are similar to those which belong to aneurism of the arch of the aorta." And what does Dr. Baillie enumerate as the symptoms of aneurism of the arch of the aorta? First, difficulty of breathing. But that may arise from a thousand causes in the heart, lungs, or other parts; and has been absent in aneurism of the heart. Secondly, more or less pain in the aneurismal tumour, or some other part of the chest. But here there is no tumour; and pain in some other part of the chest would certainly never lead us to a knowledge of the disease, but rather to a misconception of its seat and nature. The pulse, he says, is sometimes irregular; but immediately subjoins, that "often no irregularity can be felt in it." The chief symptoms he pronounces to be "a strong pulsation in the chest, commonly visible to the eye, when the chest is exposed to view;" but again immediately subjoins, that he has felt the same kind of pulsation in other cases;—for example, in adhesion of the pericardium, in slight pericarditis with slight hydro-pericardium, and in ordinary morbid enlargement of the heart. Indeed no strong pulsation, except palpitation of the heart, and in most cases not even that, has occurred in this affection. The most decided characteristic of aneurism of the aorta, however,—belonging only to aneurism,—he regards as a strongly-pulsating external tumour, when the aneurism has attained a large size. But aneurism of the *heart* rarely attains a large size; and I do not know that it ever produced an external tumour. And after all, a diagnosis would be required between aneurism of the *heart,* and aneurism of the *arch of the aorta.* It therefore really appears to me,—and I say it with all the respect due to an amiable and industrious man,—that Dr. Baillie would have done better in saying that there were *no* particular symptoms of the disease; — especially as he never met with more than one example of it. In Talma, who died of a strangely-neglected stricture of the rectum, no symptoms had led to a suspicion of cardiac disease. In a patient of Dr. Johnson's,—General Kidd,—death took place suddenly from rupture of the aneurism, without any previous symptom of its existence. The same happened in Dr. Reynaud's case. In a patient of Cruveilhier's, severe asthmatic paroxysms took place; with a sense of constriction, particularly about the heart; and with a peculiar sensation in the arm-pits. These symptoms, together with hardness, fulness, and occasional intermittence, of the pulse, and suffusion of the face, led to the suspicion of organic disease of the heart. But auscultation, at that time, was not yet cultivated. The hardness and fulness of the pulse arose from hypertrophy of the left ventricle.

In the case which supplied the preparation before me, the patient (a man aged

thirty-two, was admitted into St. Thomas's Hospital, March 2, 1826, on account of palpitation of the heart, especially on moving or lying down; inability to lie in any other position than on his back; sudden starting up during sleep; constant dyspnœa and cough, with a little mucous expectoration. The pulse was regular, not much quicker than natural, but exceedingly weak. He had discharged large quantities of tape-worm, by means of oil of turpentine; and suffered severely from rheumatism the preceding winter, and was still complaining of it. These symptoms gave no information as to the nature of the disease. They only led to a suspicion of some affection of the heart. I was not, at that time, well-practised in auscultation; but found the ventricular impulse of the heart very strong all over the right half of the cardiac region; and therefore concluded that the disease existed in the right ventricle. In two months, he became much better under rest, and moderate antiphlogistic treatment; experienced less palpitation and dyspnœa; could lie on both sides; and was stronger. The ventricular action was no longer strong on the *right* side; but was now both loud and strong in the lower part of the *left*. I could thus form an opinion, as to the seat and nature of the disease. The dyspnœa, after this time, gradually increased for a fortnight; and he then died. On opening the body, two aneurisms were found at the upper part of the *left* ventricle; but on the *right* ventricle, was a tumour or large tubercle, the size of a pigeon's egg, with several smaller ones. The force originally observed in the *right* half of the cardiac region, was now explicable; although the aneurisms sprang from the *left* ventricle. The aneurisms, when I first saw him, were probably not large enough to occasion symptoms so considerable as the tumour on the *right* ventricle; but as they increased, decided symptoms necessarily arose in the *left* half of the cardiac region;—much exceeding those produced in the *right* by the tumour.

I have very lately met with a case of aneurism of an *auricle*;—a part which has never, I believe, been recorded to have laboured under that disease. There was hypertrophy and dilatation of the left ventricle, with extreme ossification and cohesion of the mitral valve;—the auriculo—ventricular opening being proportionably reduced, the sinus of the left auricle formed an aneurism of large size, with very dense and thick layers of fibrin for its walls; and these had reduced its cavity to a very small capacity. The action of the ventricles had been strong, loud, and extended; and a dull sound had been given, more extensively than natural, on percussion of the cardiac region. The hypertrophy and dilatation of these parts, were pronounced during life. The pulse had been feeble, and the breathing very difficult; and the legs had swelled. The feebleness of the pulse, notwithstanding the strong action of the left ventricle, arose from the small quantity of blood discharged into the left ventricle to be propelled into the aorta; but had not been ascribed to this cause, as there was no *bellows-sound*, or *thrill*. Neither the aneurism, nor the constriction of the left auriculo-ventricular opening, had been suspected. The absence of a bellows-sound arose from the circumstance that the opening, though constricted, was still perfectly commensurate with the reduced capacity of the auricle;—retaining its natural proportion to the auricle; and affording a sufficient outlet to the small quantity of blood that was to be discharged. The fact is as interesting as the situation of the aneurism is extraordinary.

The case proves, for the first time, that cardiac aneurism is not peculiar to the left ventricle, nor even to the ventricles. I may remark, that my case of *ventricular* aneurism affords an argument additional to those already on record, and adduced by Dr. Reynaud, of the error of Breschet in supposing it to be generally situated towards the *apex* of the ventricle. The two aneurisms, in this case, were lined by a smooth membrane, continuous with that of the ventricles; and thus afforded also an additional proof that, in these cases, the internal membrane is not necessarily injured,—as Breschet must also imagine, when he calls them "*false* consecutive aneurisms;" though it must be allowed, that he did not consider the ten cases with which he was acquainted, sufficient to afford a perfect history of the disease. *Dr. Elliotson, on Diseases of the Heart; Pages* 28—30.

No. X.

DEATH OF GEORGE THE SECOND.

SMOLLET, in his "History of England" (Volume V. Page 418), makes two egregious blunders in his account of the King's death. "On the twenty fifth day of October, 1760," he says, "George, King of Great Britain, *without any previous disorder*, was (in the morning early) seized with the agony of death, at the palace of Kensington. He had risen at his usual hour, drunk his chocolate, and inquired about the wind,—as anxious for the arrival of the foreign mails. Then he opened a window of his apartment; and, perceiving that the weather was serene, declared he would walk in the garden. In a few minutes after this declaration, while he remained alone in his chamber, he fell down upon the floor. The noise of his fall brought into the room his attendants, who lifted him on the bed; when he desired, in a faint voice, that the Princess Amelia might be called; but before she could reach the apartment, he had expired! An attempt was made to bleed him; but without effect; and indeed his malady was far beyond the reach of art; for when the cavity of the thorax was opened, and inspected by the serjeant-surgeons, they found the right ventricle of the heart actually ruptured, and a great quantity of blood discharged into the pericardium; so that he must have died instantaneously, in consequence of this effusion. The case, however, was so extraordinary, that *we question whether there is such another instance upon record.* A rupture of this nature appears the more remarkable, as it happened to a prince of healthy constitution, unaddicted to excess, and advanced far beyond that period of life, when the blood might be supposed to flow with a dangerous impetuosity."

Now we have seen that a member of the very same family,—the Princess of Brunswick, died not only of a rupture of the *heart*, but of a rupture of the very *same ventricle* of the heart, in 1730; and Dr. Smollet's reflections on the improbability of rupture from the moderate impulse of the blood in the King, are groundless; as ruptures of the heart and aorta rarely occur, under the most *violent* impulse, unless there be disease of substance; and when the latter exists, rupture may occur under the most feeble impulse of the blood. Rupture of the blood-vessels of the head, is most common in the aged; as the coats of those vessels are most frequently diseased in the decline of life.

So far is it from being correct that his Majesty had experienced no particular disorder, that Dr. Nicholls, the King's physician, in his account of the dissection, in the "Philosophical Transactions" for 1762, informs us that "His Majesty had, for many years, complained of frequent distresses and sinkings about the region of the heart; and his pulse, of late years, was observed to fall very much upon bleeding." As if errors were predestined on this point, Dr. Forbes, in his translation of Laennec, states that "George the Second, of England, is often said to have fallen a victim to the same accident as Philip the Fifth, of Spain;—a rupture of the *heart*; but his death was occasioned by rupture of the *aorta*." The words of Dr. Nicholls, however, are the following:—"The pericardium was found distended with a quantity of coagulated blood, nearly sufficient to fill a pint-cup; and upon removing this blood, a round orifice appeared in the middle of the upper side of the *right ventricle of the heart*,—large enough to admit the extremity of the little finger. The ventricles were found absolutely devoid of blood, either in a fluid or coagulated state." Aneurism of the aorta *existed*, but was not *ruptured*. The middle and interior coats were split; but the external was entire,—as in the first stage of false aneurism; and merely an elevation was produced.

It is amusing, at this time, to read Junius's calculation on an hereditary tendency; and his hinting in 1770 to George the Third, who died in 1820, the possibility of a long minority; as "every true friend of the House of Brunswick sees, with affliction, how rapidly some of the principal branches of the family had dropped off."— (Letter XXXVII. To the Printer of the Public Advertiser.)

In George the Second, the internal and middle coats of the aorta presented a transverse fissure; around which was a coagulum under the external coat, which would soon likewise have burst, perhaps longitudinally,—exactly as in the case of my patient at St. Thomas's Hospital; and had no rupture of the right ventricle occurred, as above described, sudden death would ultimately have taken place, from rupture of the aorta.—*Dr. Elliotson, on Diseases of the Heart; Pages* 31 *and* 34.

No. XI.

CONGESTION OF THE LUNGS.

J. G., aged thirty-five years, by business a gardener, a mild and extremely steady man, laboured for two years under dyspnœa, pyrexia, cough, pain of the chest, bloody expectoration, and at length profuse hæmoptysis. Sulphuric acid with sulphate of magnesia, sub-carbonate of lead with opium, and blisters innumerable were prescribed in vain. The hæmoptysis recurred, with increased frequency and violence; and he was ultimately exhausted. Four days previously to his death, icterus began in his face and neck; and at the period of his dissolution, it was deep and considerable. The right hypochondrium, too, had become tender; and the lower extremities were œdematous.

On opening the body, the surface of the lungs presented numerous hard, circumscribed, very dark patches of various sizes;—from that of a sixpence, to the size of a crown. A person not of the profession would have supposed them to be so many mortifications. Blood, however, when abundantly accumulated in the small vessels, often causes a counterfeit appearance of mortification in the stomach and intestines, (as Dr. Baillie has pointed out), and in many other parts. Such was the nature of these patches. On cutting perpendicularly through them, the hardness and dark colour were found extending inwardly, an inch or less,—equally circumscribed as on the surface.

The intervening spaces were perfectly healthy. Nearly the whole of the inferior lobe, on the right side, had undergone the same change as the circumscribed portions in the other lobes. This change consisted in a prodigious congestion of blood, which gave the dark colour and hardness; but which could not be squeezed out. The slices were quite diaphanous, and of a beautiful red colour. No other change,—no disorganization was in any part discernible. It seemed as if the most minute vessels, in various parts, had become dilated, as in nævi materni; and had thus allowed the escape of the blood. Had the symptoms been those of acute inflammation, and had the blackness not been in detached portions, there would have been nothing singular in the case; and had the disease been simply chronic inflammation,—which is argued by a frequent pain at the anterior and lower part of the chest, always yielding to blisters, and a large quantity of bloody fluid in both pleuræ after death,—yet it is surprising that this should have occured in patches, and should have induced no suppuration or disorganization, but merely hæmoptysis and pain.—*Dr. Elliotson, in the "Annals of Medicine and Surgery" for* 1816.

This state of the lungs has been termed by Laennec, and I must think very absurdly, *pulmonary apoplexy*. Dr. Forbes mentions that Dr. Leveillé read a memoir on the subject to the Academy of Sciences at Paris, in 1816; and that Dr. Hohnbaum, of Hildburghausen, published (at Erlangen, in 1817) three cases of sudden and fatal effusion into the substance of the lungs. The lungs were distended with dark-coloured blood,—partly fluid and partly solid; and were almost too large for the chest. In one case blood was also in the bronchia; and in another in the pleuræ. These cases appear to have been nothing more than a laceration of blood-vessels in the very substance of the lungs; and the patients

died from the combined effects of internal hœmorrhage and oppression of the lungs,—of syncope and asphyxia. Corvisart had formerly described such a case, in his translation of Avenbrugger. From the suddenness of the event, and the congested and lacerated state of the parts, Dr. Hohnbaum had given the name of "pulmonary apoplexy" (Lungenshchlagfluss) to these cases. But neither sudden death on the one hand, nor congestion and effusion of blood on the other, constitute apoplexy. In apoplexy, respiration and the action of the heart may continue; but relation and sensation have ceased, totally or partially, in the brain.—*Dr. Elliotson, on Diseases of the Heart*; *Pages* 32 *and* 33.

No. XII.

MORBID SOUNDS OF THE HEART.

The lining membrane of the heart's cavities and valves, on one or both sides, is occasionally found intensely red:—that of the aorta, or pulmonary artery, or both, generally shewing the same appearance; and the redness, which is of necessity most striking in the valves, cannot be washed away without maceration for some hours; or even days. It cannot always be ascribed to the imbibition of blood; because, frequently, no blood is found in contact with the reddened part; and the artificial application of blood to the interior of an artery, during forty-eight hours, has failed to redden it to the same degree. I have seen the heart and aorta quite empty where this redness existed. Neither can it be ascribed to congestion from dyspnæa; for I have seen it where death had taken place in a moment, in the midst of perfect general health; nor to decomposition;—for I have witnessed it on the day following death in cold weather. I have seen it intense, even when all these conditions were united;—fixedness of colour, freedom from the contact of blood, sudden death, perfect general health, and absence of decomposition. Of course, mechanical obstruction to the passage of the blood from the vascular system of the heart, or a softened state of the organ, either from disease or from incipient decomposition, will cause the blood in the substance or the cavites of the heart to redden the lining membrane deeply.

I am not aware of any cardiac symptoms to which inflammation here would give rise, except rapidity of pulse; increased force and sound of the heart's action,—exactly as occurs in pericarditis; and,—when the portion covering the valves and their immediate vicinity, is not only inflamed, but thickened, covered or bound down by an effusion of fibrin, or constricted,—those preternatural sounds which the narrowing of a cardiac orifice, or of a large artery produce;—denominated the "*bellows*-sound," and the "*file*-sound." Andral has seen the membrane thickened, and easily peel off in large portions; and Baillie, Bertin, and others, have found fibrin lying upon it after acute inflammation. If one of the above-mentioned sounds be not produced, I presume acute inflammation of the lining membrane of the heart, can be distinguished from pericarditis only by the absence of pain in the particular directions pointed out when treating of the latter disease, and of tenderness on pressure applied in the manner which I then pointed out.

Acute inflammation of the lining membrane of the heart, now and then occurs alone; but far more frequently in those who have already some chronic disease of the heart; or it accompanies acute pericarditis. I have never opened a person who died with this acute affection; but four times I have suspected its existence, when acute pericarditis was present. The only ground of my suspicions was the occurrence, in these cases, of a sound like that of a bellows, accompanying the contraction of the heart;—a symptom which the most assiduous French auscultators (Laennec, Bertin, Andral, Collin) do not consider as belonging to pericarditis; and which my experience, and that of all my friends accustomed, like myself, to employ the stethoscope in every case of pectoral disease, shews to be no symptom of mere pericarditis. Indeed, there is an impossibility in imagining how it should

be; for we hear it every day (where no pericarditis exists) from any mechanical disturbance to the course of the blood, in any point of its progress through the heart, or even through the arteries. In two of these four cases of acute pericarditis in which I heard it, the symptoms of pericarditis were very mild; yet the sound was considerable, and it ceased after antiphlogistic measures had been employed. On the other hand, I have attended numerous violent and well-marked cases of acute pericarditis, and have not heard it; though in none did I ever omit daily to employ the stethoscope; and, as well as some of my friends, have made this a point of careful investigation. In the two other cases, the symptoms of pericarditis were certainly violent; but, after they were entirely subdued, the bellows-sound continued as loud as before;—evidently resulting, therefore, not from the presence of pericarditis, but from those organic changes that every day give rise to the bellows-sound, and are often preceded by pericarditis. For the same reason, I have known it not begin, till all the symptoms of the pericarditis had actually subsided.

In acuto-chronic, and chronic pericarditis, this sound is not uncommon; and, when once it has begun, it may subside for some weeks, or may continue till death;—lasting, perhaps, for years. It depends, not upon the pericarditis, (for this may at length cease, and possibly the whole membrane cohere), but almost always upon chronic disease of the lining membrane about the valves and openings; or upon some induration and enlargement external to the openings or passages from the heart, and compressing them; or upon dilation of a cavity behind an opening. I have never opened a person whom I had seen labouring under chronic pericarditis, and affording the bellows-sound *constantly*, in whom a diseased condition of an opening or passage from the heart did not present itself;—in whom the opening or passage was not below its natural proportion to the cavity behind it;—being itself lessened or compressed; or the cavity behind it increased, so that the opening was become virtually too small. The occasional occurrence of acute inflammation of the lining membrane or substance of the heart, simultaneously with *acute* inflammation of the pericardium,—effusing lymph about the openings, inducing spasmodic constriction of them, or turgescence around them; and the tendency of the lining membrane and the substance of the heart to become diseased, and the morbid depositions to take place externally to the roots of the two great arteries, when the pericardium is the seat of *chronic* inflammation;—these are the reasons, I am satisfied, why the bellows-sound is ever heard in conjunction with the symptoms of pericarditis.

I have never (except in one, and that a most extraordinary case) seen the opening leading from an auricle or ventricle materially narrowed, without having heard a preternatural sound at the moment of the contraction of the auricle or ventricle behind it. The sound is sometimes protracted; and sometimes, while one portion of it resembles the blowing of a bellows, I have heard another resemble the filing of wood, or the action of a fine saw; though this compound sound is not mentioned by authors. Once, where the pulsations of the heart varied in force, the sound which occurred at the auricular contraction, and in the right side of the heart, was loud, rough, and sawing, at the strong pulsations; and small and shrill at the weaker. In another case, in which the force of the pulse varied, the bellows-sound (ventricular, and at the right side of the cardiac region) was perceptible at the strong pulsations only. In both cases, immediately after the preternatural sounds, a faint sucking or aspiring sound was heard. In one case, apparently of constriction of the opening of the mitral valve, the sound was small and shrill (*bruit de rape*) at the centre of the sternum, but full and bass at the cartilages to the left; and of the same nature, though fainter, all over the left half of the back. Sometimes it altogether resembles the sound of a file or a saw; and at times I have heard it exactly resembling the cooing of a dove;—a variety not mentioned, I believe, by authors. In one case it was so loud, that I heard it when standing nearly a foot from the patient. Three times have I heard this cooing sound.

Just as is observed with respect to the tissues of all other cavities, and of all canals, the portions of the lining membrane about the *boundaries* of the cardiac cavities, are the spots most likely to be affected. Scirrhus and stricture of the alimentary canal affect, chiefly the cardia, pylorus, and rectum; and the termi-

nation of the ileum is the most frequent seat of intestinal ulceration in fever. Ulceration of the air-tubes originates, most frequently, in the larynx and the air-cells. The lips are continually affected with cancer; and the neck and mouth of the bladder and womb, are commonly the original seat of the organic diseases of those organs. In the same way inflammatory thickening, and all other diseases of the lining membrane of the heart, by far most frequently occupy that portion which invests the *openings*, and assists to form the *valves*; and if it affect the rest also, it is in a much slighter manner; although, occasionally, the rest of the membrane is equally thickened; and I have seen the valves and openings free from disease, while the rest was so thickened that, on cutting the ventricles through, the red incised surface presented a thick white inner edge. When the pericarditis has been intense and general, the inner membrane has also, in many instances, suffered so much, that two sets of valves, and even three, are seriously altered. I have seen the base or zone only of the valves thickened and contracted; so that a real stricture impeded the progress of the blood into the artery.

In the natural state the valves are translucent, fine, and flexible. When the subject of chronic inflammation, they become opaque and yellowish, thick and rigid. These changes are seen in dead subjects, in various degrees; and may be considerable, without reaching such a point as sensibly to disturb function. Their progress also takes place with various degrees of celerity. The surface of the valves may retain its smoothness; though frequently we observe asperities from excrescence or deposition. The induration varies in different points; so that one portion is partly translucent, while the other is not only opaque and rigid, but even horny. The induration at length amounts to cartilage; and the part creaks when cut. The last stage is complete ossification.

As the thickening and induration proceed, the opening becomes narrow;—both from the thickening of the edges, and from the approach of the portions of the valves towards each other. The several portions of the tricuspid and bicuspid valves, grow up completely into a membrane, with an aperture in its centre; and this aperture is sometimes, as seen from the ventricle, and *generally* when viewed from the *auricle*, not circular, but longitudinal;—a mere slit usually (Mr. Adams remarks) of a crescent form; with the concavity towards the root of the aorta, and the convexity backwards; and the extension of the valvular membrane is sometimes so considerable, that it appears to project into the ventricle, in the form of a pouch or funnel. The semilunar valves of the pulmonary artery, stand firm and convex; as if distended by repletion of their sacs; and grow up, so as to leave only a small round or triangular opening in their middle. Sometimes, according to Bertin and Laennec, the margin of the aortic valves is folded in, and sometimes folded *back*. Sometimes only one set of valves is affected; but more frequently, if one set is severely affected, another set is at least opaque, and thickened to a certain degree. When the impediment to the progress of the blood is considerable, the auricle behind is usually dilated; and is sometimes attenuated, sometimes of its natural thickness, and sometimes (though rarely) thickened. Whether it be an *auriculo-ventricular* opening, or a ventriculo-arterial, the effect is the same. Occasionally, when a ventriculo-arterial opening is narrowed, the ventricle behind is dilated, or thickened, or both; but frequently this is not the case. The auricles suffer from being muscular only to a certain extent, and being throughout of insignificant extent, compared with the ventricles.

Mere thickening, and all other diseases, are seen much more frequently in the *left*, than in the *right* half of the heart; for which circumstance no other reason can be given, than that assigned by M. Bertin; namely, that the left is stimulated by *arterial* blood, and the right only by *venous*. The difference between arterial and venous blood, as agents or living parts, is demonstrated by the experiment of injecting venous blood into the carotids; when stupor and death ensue. If irritation occur in the heart, it is more likely to be maintained and pushed on to serious disease in the *left* side, by the stimulating arterial blood from the lungs, than by the inert venous blood returned to the *right* side, after having served its purposes in the body. The difference cannot be attributed to degree of function; for the right side performs as much function as the left;—nor to obstruction to the course

of the blood; for obstructions happen oftener on the *right* side, owing to the frequency of pulmonic affections.

When the preternatural sounds are not very intense, the ear must be brought into contact with the chest, or some solid medium employed; but when intense, they may be heard at a little distance. Some have conjectured, that when the narrowed opening exists in a valve which has become of no more than *cartilaginous* hardness, the *bellows*-sound is heard; and when of *osseous*, the *file*-sound. I believe that degree of obstruction is the great cause of varieties of sound; but the diversity I have noticed of the same sound, in listening at different spots, shews the power of distance, or of variety of media to modify it.

From the occasional loudness of the morbid sound, wherever situated, (and I have sometimes heard it, in various degrees of intensity, at every part of the chest), a difficulty sometimes occurs in deciding whether it originates on the left or on the right side. But a very careful examination of both sides of the cardiac region enables us, in general, to say distinctly, that it is loudest on one side; and there we may always presume its source to be. Sometimes, but less frequently, a difficulty exists from the extreme rapidity of the heart's action, as to whether the morbid sound is heard at the ventricular or the auricular contraction;—as to whether the sound is heard at the moment of the arterial pulse or not. But by listening for a length of time, and repeatedly even during only one visit, the difficulty generally vanishes; the confusion which at first prevailed declines; and the coincidence and succession of the phenomena become evident;—exactly as happens when, on first surveying a large collection of visible objects, all are confused; but at length every object is perceived distinctly; or as when a person listens, for the first time, to the healthy sounds of the lungs or heart, and finds all confusion; but, by perseverance, gradually distinguishes each with perfect accuracy.

There is sometimes a thrill perceptible on applying the hand upon the heart;—a tremulous motion resembling the purring of a cat. This was stated by Corvisart, and afterwards by Laennec, to distinguish narrowing of the left auriculo-ventricular opening. But the latter, in his second edition, mentions that he had found reason not to think it peculiar to the narrowing of that orifice. It results from the same causes as the preternatural sounds. I believe it occurs more frequently when that orifice is narrowed, than when any other is obstructed.

I believe that when this opening is narrowed, the pulse is generally irregular, both in force and frequency;—a peculiar combination well known to practitioners, in which several beats succeed each other in rapid succession, and with tolerable force; while others, again, occur slowly, and with little force;—perhaps so weakly, that they can scarcely be perceived, or not at all; although, at the heart, the pulsation is evident enough. This most irregular pulse is thought, by Mr. Adams, to be pathognomonic of narrowing of the left auriculo-ventricular opening. Corvisart thought extreme irregularity of the pulse, both in force and frequency, to characterize aneurism of the *aortic* opening. I do not happen to recollect a pulse irregular in force and frequency, in a single case of narrowing of the aortic opening solely; while I know that it is very common in narrowing of the left auriculo-ventricular opening;—though possibly not *peculiar* to it, or indeed to narrowing of *any* opening. Mr. Hodgson also mentions that, in narrowing of the left auriculo-ventricular opening, there is often a double pulsation of the heart; that is, two beats of the heart, to one at the wrist;—a pulsation of the heart from the action of the *ventricle*, and another from the action of the *auricle*. He appears to attempt to explain the fact; but this able surgeon expresses himself in rather an obscure manner. "The auricle," he says, "first acts, and propels its contents into the ventricle; but, from the contraction of the communication, the blood is not, as in the natural state, poured at once into that cavity. The ventricle, though imperfectly filled, contracts; and forces the blood into the aorta. Thus there is a pulse caused by the action of the *auricle*, and another by that of the *ventricle;* so that for every pulsation at the wrist, two pulsations are perceptible at the heart." This does not appear to me a satisfactory explanation. The truth is that, in health, there is a double action of the heart perceptible to the ear;—one action of the *auricles*, and another of the *ventricles;* though this was not generally noticed at the time Mr.

Hodgson wrote. When the left auriculo-ventricular opening is narrowed, so that the blood can only be squirted into the ventricle, the auricular action is sometimes very distinct to the hand, in the condition of a thrill or purring; which is what Mr. Hodgson had remarked, and called (to use his own words), — "an irregular thrill, or *bruissement*, as Corvisart terms it; rather than a distinct pulsation." Sometimes it is a distinct shock; and, in another sentence, Mr. Hodgson speaks of it as such; saying,—"Thus there is a pulse caused by the action of the auricles, and another by that of the ventricles;"—"nor is the auricular pulse trifling." This happens only, I believe, when the walls of an auricle are increased in substance,—are in a state of hypertrophy; so that they act with a force approaching to that of the ventricles, and a double stroke of the heart may be felt by the hand. That this, and not the imperfect repletion of the left ventricle, by which it acts twice, is the reason of the double stroke, appears to me shewn by the fact that, when it has been observed, the auricle or auricles have always been hypertrophied, and in some cases the auriculo-ventricular opening has not at all been narrowed; and, secondly, that it is not observed, however narrow the auriculo-ventricular opening may be, if the auricle is not hypertrophied;—and, indeed, this hypertrophy is rare; as the obstruction usually produces dilatation and thinning.

Corvisart remarks, that obstruction at either aperture on the *left* side, causes more irregularity than obstruction on the *right*. Even the thrill is frequently absent, when the narrowing is considerable; and I am ignorant upon what exact conditions it depends;—whether upon the degree of the narrowing, or on the shape of the diseased opening, or what.

A third peculiarity has been remarked in the narrowing of the left auriculo-ventricular opening; namely, smallness of the pulse; and a good example of this is given by Mr. Abernethy, in the first volume of the "Medico-Chirurgical Transactions;" and by Mr. Adams, in the fourth volume of the "Dublin Hospital Reports." The small quantity of blood poured into the left ventricle, at each auricular contraction, is insufficient to enable the ventricle to project a due portion into the arteries;—whence the smallness of the pulse. But the same smallness of pulse results from a narrowing of the aortic opening; and nothing but the observation whether the preternatural sound which may exist, occurs at the *auricular* or at the *ventricular* action, can determine whether the narrowing is at the auriculo-ventricular, or at the ventriculo-aortic opening. It may also result from a general diminution of the cavity of the left ventricle, accompanied by *no* narrowness of opening; for this must obviously occasion a small projection of blood into the arteries, equally with a diminution of aperture. The importance of this symptom alone, therefore, is absolutely nothing. It does not necessarily indicate narrowing of the openings in the left side of the heart. If, indeed, the preternatural sound be heard at the ventricular contraction, this smallness of pulse may assist in leading to the idea that the narrowing is on the left side of the heart; but the greater loudness of the sound on the left side, will sufficiently declare it. The inferiority of this symptom in the pulse, to the observation of the preternatural sound, is shewn by the preternatural sound occurring long before the pulse grows small. I have often noticed no smallness of pulse up to the time of death; when an auricular or ventricular preternatural sound, loudest at the left half of the cardiac region, shewed the left auriculo-ventricular, or ventriculo-aortic opening, to be diminished; and, after death, this state of things was discovered. When the narrowness is at the mouth of the aorta, the action of the left ventricle, notwithstanding that the pulse is small, is sometimes very strong,—owing to its walls being hypertrophied.

Interesting as is the presence or absence of these symptoms of the thrill, the irregularity of the pulse in force and pregnancy, and the smallness of the pulse;—which are chiefly relied upon, in general, to determine the existence and seat of a narrowing of a cardiac opening; and useful as they are, in many cases, to assist the diagnosis, they are all far inferior to the observation of the existence, or non-existence, and of the seat of the preternatural sound. Yet they should be looked for, and investigated in every case; for they may confirm the inferences drawn from the morbid sounds; and cases may happen, in which the observation of these may be necessary to deducing the source of the sound.—*Elliotson, on Diseases of the Heart; Pages* 13—17.

No. XIII.

MALIGNANT CHOLERA AT EDINBURGH.

CASE I.

Janet Campbell, aged 58. After having been in attendance on a woman who died of cholera, and sitting up with the body through the night,—during the whole of which time she was in a state of intoxication,—she was seized, at nine o'clock in the morning, with the usual symptoms of cholera, in a violent form. At two o'clock, a vein was opened in the arm; but blood could not be obtained in a stream; and only six ounces were abstracted. A sinapism was applied to the spine; and two ounces of whiskey-toddy were given. Three hours afterwards, she was brought into the hospital, and placed under the care of Dr. Mackintosh. She was placed on the steam-bed, and ordered to have warm wine-and-water occasionally; and to have the legs and arms well rubbed with a stimulating embrocation. She had no vomiting or purging for some hours after admission, nor was any urine passed; but she was very restless; and complained of great pain in the back. Occasionally she attempted to raise herself suddenly in bed. The pulse, which could not be felt on her admission, afterwards became perceptible; but was small, weak, and very compressible. The other symptoms were also alleviated, under the frequent use of turpentine-enemata, occasional sinapisms, and a powder of rhubarb and calomel every hour; but soon after midnight she began to sink. The restlessness increased; she turned incessantly from side to side; and looked wildly around. The lower extremities were quite warm; while the upper were cold, and very blue. There were constant retchings; quick and laborious respiration; and, at intervals, a convulsive shutting of the lower jaw. She died at half past two in the morning.

On inspection, twelve hours after death, the meningeal arteries, the veins of the pia mater, and the arteries at the base of the brain, were found much distended with dark-coloured, fluid blood. There was very considerable serous effusion between the arachnoid membrane and the pia mater; but there was very little in the ventricles. This was probably owing to the spine having been previously opened; —thus allowing an exit for the serum, which, when the ventricles were opened first, they were always found to contain. Arborescent vascularity was found on the surface of the cerebral convolutions. There was considerable effusion of serum in the spinal canal. All the vessels ramifying on the membrane of the spine, and on the origins of the nerves, were filled with dark-coloured blood;—an appearance which was most remarkable in the dorsal and lumbar regions. The rachidian veins were much distended with black blood. The peritoneum was minutely injected,—particularly in the neighbourhood of the bladder; and there were numerous red spots on its surface. Two or three ounces of turbid serum, containing flakes of yellowish lymph, were found in the pelvis. The stomach presented, externally, a whitish appearance;—and contained a good deal of white fluid, mixed with flakes. Its mucous membrane was much softened; and presented a large ecchymotic spot on its surface. The small intestines were distended with a greenish semi-fluid matter. The larger intestines were contracted; and could not be distended by insufflation. The bladder was empty and contracted. The liver was of a pale yellow colour; its vessels were injected; and its surface, in several places, presented a puckered appearance. The gall-bladder was large, and distended with green bile; which, by pressure, could be forced into the duodenum. The right kidney was sacculated; but otherwise healthy in structure. There were old adhesions of the pleura; the vessels of which appeared minutely injected. The intercostal

veins were gorged with black blood. The sympathetic nerves and par vagum were healthy. The semilunar ganglion of the left side, was of the same colour as the crus of the diaphragm; that of the right side was red, but paler than its fellow. The vasa vasorum of the aorta and pulmonary artery were much injected. The right auricle and ventricle contained a large fibrinous clot; and the ventricle was softened and flabby. There was a small clot in the left auricle; the left ventricle was contracted and hard; and its parietes were about an inch in thickness. It contained a drachm of black blood. The left auriculo-ventricular opening would scarcely admit the introduction of the little finger. The arteries of the lower extremities were filled with black blood; as were also those of the upper, though not to so great an extent.

CASE II.

February 16, 1832.—Peter Elliott, eight years of age, was admitted into the hospital, under the care of Mr. Meikle, at eight o'clock in the evening. For several days he has laboured under a slight watery diarrhœa; which became much aggravated yesterday evening. The pulse is quick, and the skin hot. He was ordered eight grains of rhubarb; after which he had several dejections, containing what appeared to have formed part of his dinner yesterday. He vomited a little.

February 17.—At half past five this morning, he was ordered the following:—℞ Olei Ricini ʒv; Spiritus Cinnamomi ℥ss; Aquæ Puræ ℥j; Tincturæ Opii gtt. x. M. Fiat haustus statim sumendus.

7 A. M.—He retained the draught for about an hour; and then vomited a little. Tongue white; great thirst; pulse scarcely to be felt; inferior extremities cold. Has not complained of any particular pain. Ordered to have nitric-acid drink; and to take, every hour, a pill containing calomel.

8 A. M.—Since last report, he was placed on the heated steam-mattrass. The pulse at the wrist was at that time, and still continues, imperceptible. He complains much of thirst; and the tongue is furred at the tip and edges. Countenance sharp; eyes sunk, and surrounded by a dark circle; face and hands rather cold; body moderately warm. ℞ Submuriatis Hydrargyri gr. iv; Pulveris Rhæi. gr. viij. M. Fiat pulvis statim sumendus; et repetendus omni horâ. Applicetur sinapismus epigastrio. The pill to be omitted; the acid drink to be continued; and the extremities to be well rubbed.

9 A M.—He complains of the sinapism. Has had neither purging nor vomiting. Pulse still imperceptible.

10 A. M.—The sinapism has caused considerable vascularity of the abdomen. At half past nine, the pulse became perceptible; but is weak, compressible, and about a hundred and sixty in a minute. He has had a slight tendency to vomit; but has not ejected anything. Has passed, per anum, about half an ounce of watery fluid; with a very small portion of mucus.

12 A. M.—At eleven o'clock he had a turpentine-injection; which is still retained. Two ounces of blood were taken from the jugular vein. Pulse indistinct and fluttering. Voice less weak than it was. He is drowsy; and has vomited a considerable quantity of yellow fluid. Repetatur sinapismus. Applicetur nuchæ emplastrum lyttæ.

2 P. M.—The pulse is still very indistinct. ℞ Hydrargyri Submuriatis gr. iv; Pulveris Jalapæ gr. x. Fiat pulvis statim sumendus, et repetendus omni horâ. ℞ Sulphatis Sodæ ℥ss.; Infusi sennæ,—Aquæ āā. ℥iv. M. ut fiat injectio statim administranda, et repetenda si opus sit.

3 P. M.—Admoveatur sinapismus pedibus.

4 P. M.—Repetatur pulvis purgans. To have a little mulled wine occasionally.

6 P. M.—Has had two thin watery stools. Repetantur enema et pulvis purgans.

7 P. M.—The sinapisms have been removed, in consequence of their causing great uneasiness. The inferior extremities are quite cold; and the pulse is not perceptible. Ordered to have a little brandy and water; the legs to be well rubbed with warm cloths; and the mattress to be well heated.

8 P. M.—Since the last report he has been sinking rapidly;—the pulse remaining imperceptible, and the surface becoming quite cold. Half an hour ago he was

ordered the following:—℞ Spiritus Etheris Nitrosi ʒj; Aquæ Ammoniæ gtt. x; Misturæ Camphoræ ℥j. Fiat haustus statim sumendus. Sinapisms to be applied to the epigastrium and the feet; and the legs to be well rubbed with warm flannel. The breathing is increasingly laborious; and is performed only by the diaphragm. Boiling water poured on the extremities produces no sensation.

The patient died a quarter of an hour after the last report. This is one of the few cases in which no examination after death was allowed.

No. XIV.

ACUPUNCTURE.

The most obvious purpose of this operation, is to allow the escape through the skin of the fluid of œdema or anasarca; or of the blood, when superficially accumulated; but,—from an idea that various disorders arise from a kind of subtle and acrid vapour pent up,—it has been had recourse to by the Chinese, for the purpose of giving vent to this vapour, from time immemorial. From China, the practice spread to Japan; where, for ages, it has been very common. In 1679, Ten Rhyne, a medical officer in the East India Company's service, gave the first information to Europe, of a practice unknown to the Greeks, Romans, or Arabians. He states, that a guard of the Emperor of Japan, appointed to conduct the English to the palace, was seized with vomiting and violent pain of the abdomen, after drinking a quantity of iced water when heated. He took wine and ginger in vain; and then, persuaded that he had wind, had recourse to acupuncture, in the presence of Ten Rhyne. It appears that the Japanese are liable to a violent kind of colic, called *senki*; which they regard as too severe to arise from morbid matter in the cavity of the intestines; and ascribe to something morbid in the parietes of the abdomen, in the omentum, in the mesentery, or in the substance of the intestines; and converted, by its stay in these parts, into a vapour; the escape of which from its narrow prison, by means of acupuncture, is immediately followed by a cessation of the pain and distention. The guard laid himself upon his back; placed the point of a needle upon his abdomen; struck its head with a hammer once or twice to make it pass through the skin; rotatated it between his thumb and fore-finger, till it entered to the depth of an inch; and then, after thirty respirations (as it would appear), withdrew it, and pressed the punctures with his fingers, to force out the imaginary vapour. He made four such punctures, and was instantly relieved and got well.

The needles in Japan, are always made of the purest gold and silver,—preferably of gold, and well-tempered. Their manufacture is a distinct occupation, understood by few; and those few are licensed by the emperor. Some are fine, about four inches in length, and provided with a spiral handle, for the purpose of rotating them more easily. They are kept (by means of a ring, or a piece of silk thread) in grooves on either side of a hammer; each groove being capable of holding one. The hammer is usually made of the polished horn of the wild ox, of ivory, of ebony, or of some other hard wood. It is rather longer than the needle, and has a roundish head; covered, on the side which strikes, with a piece of leather; and rendered heavier by a little lead within. Others are of silver only, still finer at the point, with a short thick handle, bent down upon itself; and are kept, several together, in a varnished wooden box, lined with cloth. These are not struck with a hammer; but a fine copper canula, about an inch shorter than the needle, is sometimes employed to steady the latter, and prevent its entering too far.

The selection of the part of it for the operation, or for the application of the moxa,—the other great remedy of the Japanese,—is usually confided to particular persons called "Tensasi,"—*touchers*, or *searchers* of the parts; while those who

apply the needles are styled "Farittate,—*"needle-prickers;* though, occasionally, the common people trust to their own experience; only taking care not to prick any nerve, tendon, or considerable blood-vessel. The seat of the cause of the symptoms, is the proper part for the operation; and delineations of the body are sold, conveying this information. If the patient do not bear the needle well, it is at once withdrawn; but if he do, and the disease prove obstinate, it is introduced two, three, four, five, or six times. The more severe the affection, and the stouter the patient, the deeper must be the puncture. Kœmpfer, a physician who accompanied a Dutch embassy to Japan in 1691 and 1692, informs us that, in cases of colic, the Japanese make nine punctures over the liver;—in three rows of three each, about half an inch from each other. He adds, that he himself frequently witnessed the instantaneous cessation of the pain, as if by enchantment. The Orientals do not, however, employ this operation in affections of the abdomen only. In tetanus, convulsions of all kinds, apoplexy, gout, rheumatism, swelled testicle, gonorrhœa, and fevers both intermittent and continued, it is also celebrated among them;—enjoying credit,—like all remedies of undoubted efficacy in certain diseases,—for power which it does not possess over others.

Owing partly to the frightfulness of running needles into the flesh, and the high improbability of any benefit from such a practice, a hundred and seventeen years elapsed before any European practitioner made trial of it. Dujardin, in his "Histoire de la Chirurgie," and Vicq-d'Azyr, in the "Encyclopédie Methodique," mentioned it about a century after Ten Rhyne had published; but only to congratulate the world that the statements of the latter, and of Kœmpfer, had not induced any one to practise it. The first European trials were made by Dr. Berlioz of Paris, in 1810. Its power proved so extraordinary, that he employed it very extensively; and numerous French practitioners imitated his example, with the same results. A body of similar English testimony followed; and acupuncture affords a striking instance of a good remedy discovered from groundless hypothesis, and condemned, without a single trial, for more than a century.

The needles employed in Europe are of steel. They are long and fine; and are furnished either with a knob of sealing-wax at their head, or (which is most convenient) with a little handle of ivory or wood, screwing into a sheath for the needle. They are best introduced by a slight pressure, and a semi-rotatory motion, between the thumb and fore-finger; and are withdrawn by the same motion. The pain is very slight; and often absolutely nothing. The period during which the needle remains in the part, is a matter of great importance. The pain may, indeed, cease instantaneously; but more frequently it does not, till the needle has remained some time; and my own experience accords with that of others,—that one needle, remaining an hour or more, is far more efficacious than several speedily withdrawn. I usually allow the needles to remain one or two hours; and I have known them to remain twenty-four hours, without any ill effect. I have usually found the operation requisite a second time; and, in one case, lumbago did not yield till the ninth repetition. The modus operandi of acupuncture is unknown. It is neither fear nor confidence; since those who care nothing about being acupunctured, and those who laugh at their medical attendant for proposing such a remedy, derive the same benefit (if their case be suitable) as those who are alarmed, and those who submit to it with faith. Neither is it counter-irritation; since the same benefit is experienced when not the least pain is occasioned, as when pain is felt. Galvanism, likewise, fails to explain it; because, although the needle frequently becomes oxidated, and affords galvanic phenomena, while in the body, these phenomena bear no proportion to the benefit derived; equally take place when acupuncture is produced on a healthy person; and do not take place when needles of gold or silver are employed; though the latter are equally efficacious with those of steel.—*Dr. Elliotson, in the "Cyclopædia of Practical Medicine;" Volume* I.; *Pages* 33 *and* 34.

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